WADE-8170

Mini-ITX Board

User's Manual

Version 1.0

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get its running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw/

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and develop a new Intel® Mini-ITX board with latest Intel® platform for embedded application. The Portwell WADE-8170, the leading Mini-ITX adopts Intel®energy-efficient processor based on current Intel® architecture products. Transistor comparison based on 45nm processors in production and compatible for high-end computing applications with PCI-E bus architecture to adapt to today's demands and keep complete compatibility with hardware and software designed. The onboard devices support one PCI slot for flexible expansibility of graphics interfaces, integrated graphics, onboard dual Realtek ALC8111C Gigabit Ethernet controllers. It's beneficial to build up a high performance and fast transmission availability system for VARs, or system integrators.

The WADE-8170 supports Intel® Atom™ N270 Processor via Intel®945GSE and ICH7M chipset integrated GMA 950 graphics with DVMT 3.0 display memory up to 128 MB. The board supports So-DIMM up to 2GB SDRAM with dual channel DDR2 533MHz, enhanced onboard two SATA with high-speed data transferring at up to 300 MB/s, integrated Realtek ALC655 5.1 + 2 CH high definition audio codec. The onboard Super I/O ITE IT8712 chipset supports two RS-232 serial port interfaces, Hardware Monitor function, eight Hi-speed USB 2.0 ports, and two 6-pin Mini-DIN connectors for PS/2 mouse and keyboard. Besides, one DC-in 12V, 15-24V through 4-pin connector designed to support ATX power function, and a feature of CPU overheat protection will provide user more security and stability.

Combing with these outstanding features in the Mini-ITX form factor, WADE-8170 is definitely the most excellent choice for embedded applications like Network, Point of Sales (POS), automated KIOSKs, security products, medical instruments, and gaming machines.

1.2 Check List

The WADE-8170 package should cover the following basic items

- ✓ One WADE-8170 Mini ITX Main Board
- ✓ One Serial ATA cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**
  - Support Intel Atom processor N270
  - CPU bus clock: 667/533 MHz
- **Chipset**
  Intel® 945GSE and ICH7-M
- **Main Memory**
  - Support signal channel DDR2 memory interface
  - Up to 2GB DDR2 533 SDRAM on SO-DIMM socket
- **System BIOS**
  AWARD BIOS
- **Expansion Interface**
  One PCI slot and one PCI Express x1 slot through riser card
- **SATA Interface**
  Two SATA ports
- **Serial Ports**
  Support two RS-232 serial ports
- **IR Interface**
  N/A
- **Parallel Port**
  N/A
- **USB Interface**
  Support eight USB (Universal Serial Bus) ports (four at rear, two on-board for internal devices)
- **PS/2 Mouse and Keyboard Interface**
  Support dual 6-pin mini-DIN connector at rear I/O panel for PS/2 keyboard/mouse

- **Audio Interface**
  Connector of Mic-in/Line-out/Line-in
- **Real Time Clock/Calendar (RTC)**
  Support Y2K Real Time Clock/Calendar
- **Watchdog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - Generate system reset
- **On-board VGA**
  - Intel 945GSE Integrated GMA950 Graphics device
  - Intel DVMT 3.0 supports up to 128MB video memory
- **On-board Ethernet LAN**
  Dual Gigabit Ethernet (10/100/ 1000 Mbits/sec) LAN ports
- **High Driving GPIO**
  Onboard programmable 8-bit Digital I/O interface
- **Cooling Fans**
  Support one 4-pin power connector for system fan
- **System Monitoring Feature**
  Monitor system temperature and major power sources, etc
- **Outline Dimension (L X W):**
  170mm (6.69") X 170mm (6.69")

Configuration:

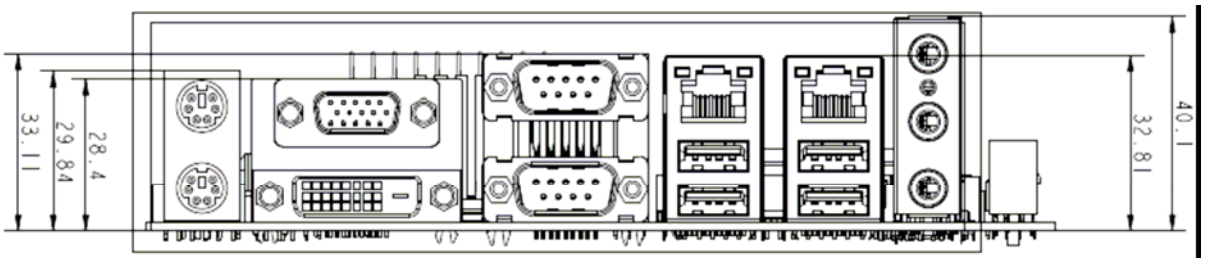
System Configuration	
CPU Type	Intel® Atom™ CPU N270 1.60GHz FSB:533 L2:512K
SBC BIOS	Portwell,Inc.WADE-8170 BIOS Rev.:R1.00.W1. T06 (12252008)
Memory	Hynix 200-pin DDR2 533 MHz SO-DIMM
VGA Card	On Board Mobile Intel® 945 Express Chipset Family
VGA Driver	Mobile Intel® 945 Express Chipset Family Version:6.14.10.4926
LAN Card	On Board Realtek RTL8111C Gigabit Ethernet
LAN Driver	Realtek RTL8111C(P)PCI-E Gigabit Ethernet NIC Version:5.708.1030.2008
Audio Card	On Board Realtek ALC655
Audio Driver	Realtek High Definition Audio Version:5.10.0.5745
Chip Driver	Intel® Chipset Device Software Version:8.3.0.1013
USB 2.0 Driver	Intel®82801G(ICH7 Family) USB2 Enhanced Host Controller Version:8.2.0.1008
SATA HDD	Dual Seagate 160GB SATA II HDD
Power Supply	Seventeam ST-400EAG-05F 12V & DigiPos Retail Blade PSU2000

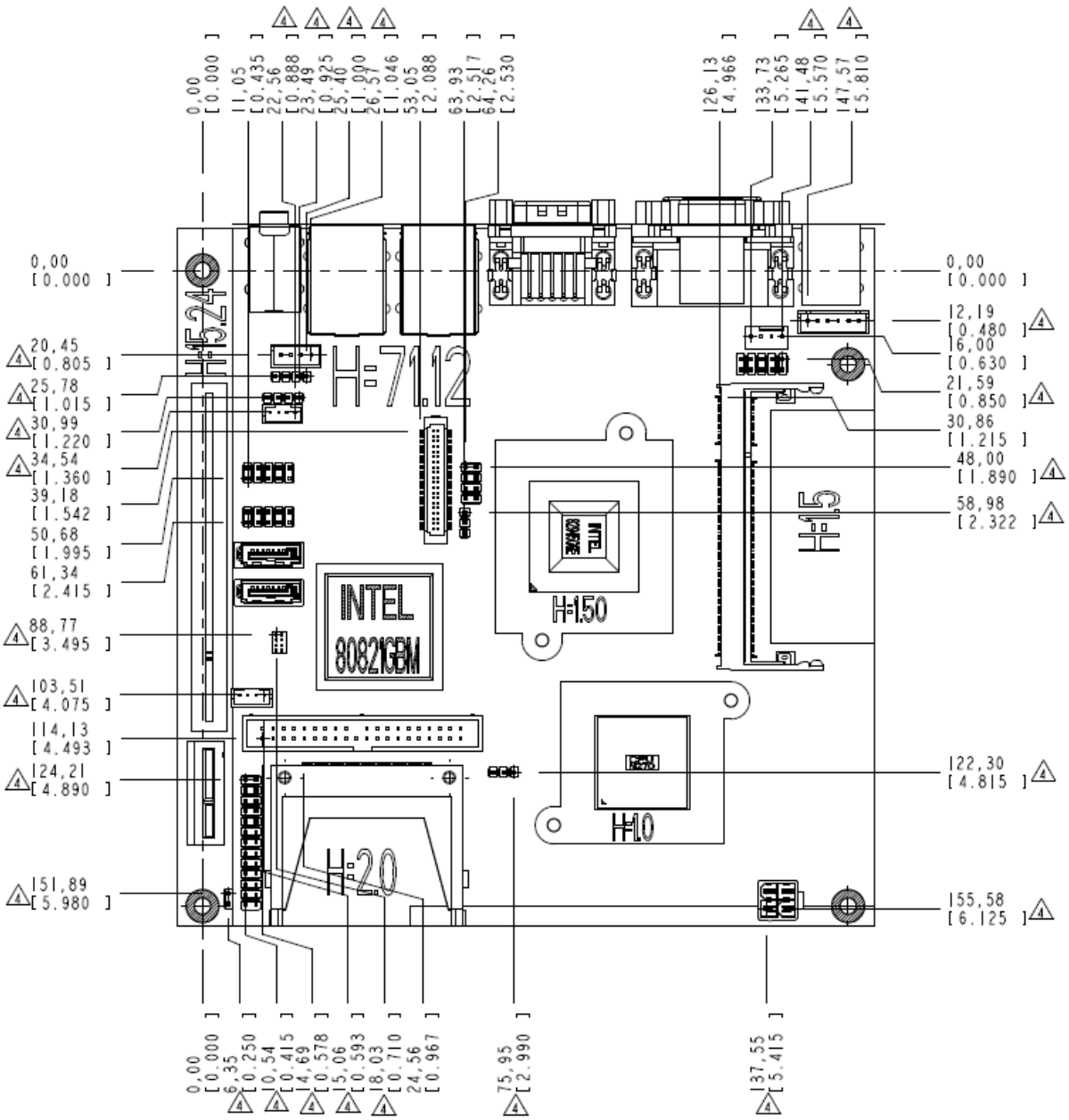
Programs for loading both CPU & VGA: Run Burning Test V5.3
RUN time: 10 / 30 Minutes.

Test Environment / Model	CPU: Intel® Atom® Processor N270 1.GHz Onboard				Note
	Power Supply: Seventeam ST-400EAG-05F +12V		Power Supply: DigiPos Retail Blade PSU2000 +24V		
OS Environment	Windows XP Professional V2002 Service Pack 2		Windows XP Professional V2002 Service Pack 2		
Normal Mode	1.46	A	1.01	A	
Suspend Mode	0.25	A	0.64	A	

- **Operating Temperature:**
  0°C ~ 55°C
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  5% ~ 90%, non-condensing

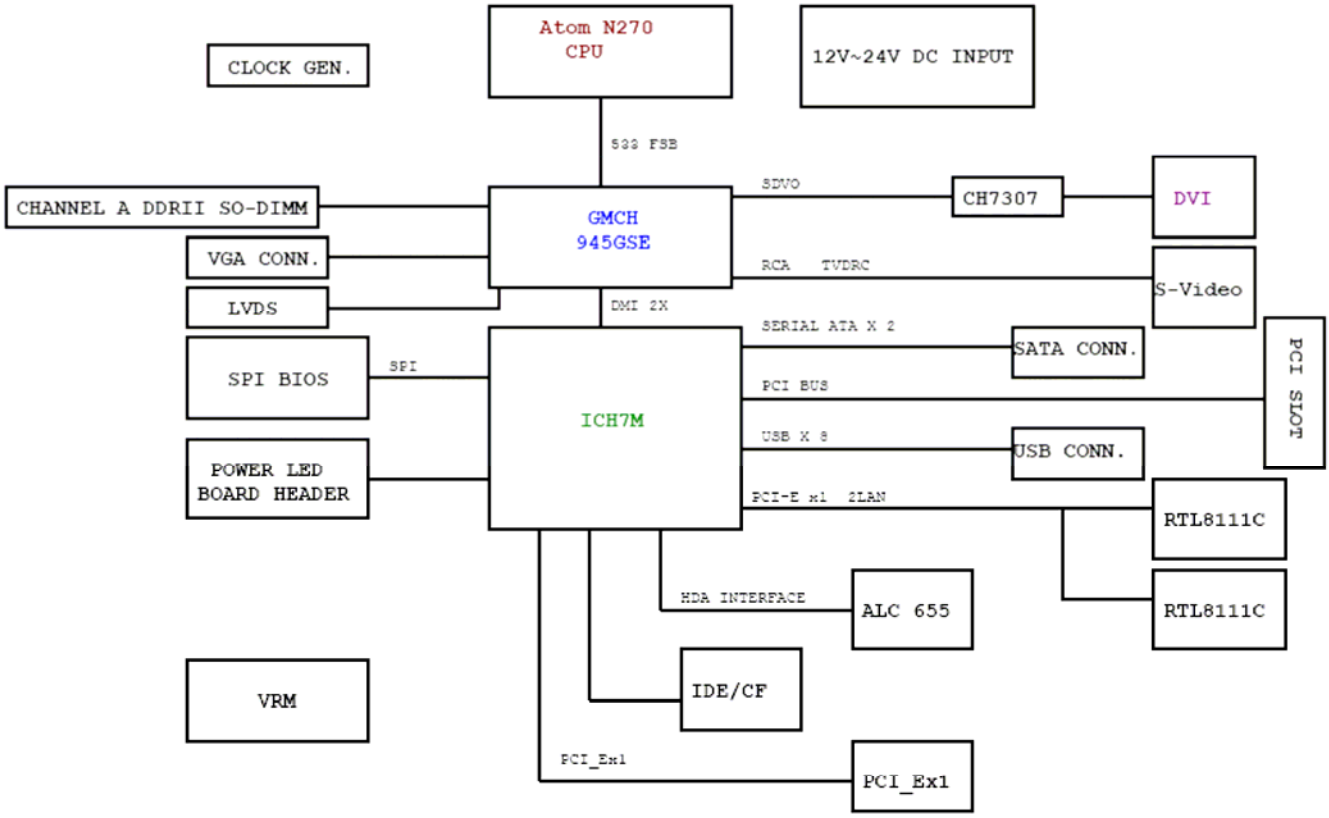
1.3.1 Mechanical Drawing





1.4 System Architecture

All of details operating relations are shown in WADE-8170 series System Block Diagram



WADE-8170 System Block Diagram

Chapter 2
Hardware Configuration

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter. The default settings are indicated with a star sign (★).

2.1 Jumper Setting

In order to customize WADE-8170's features for users, in the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 and Figure 2-2 for the Jumper locations.

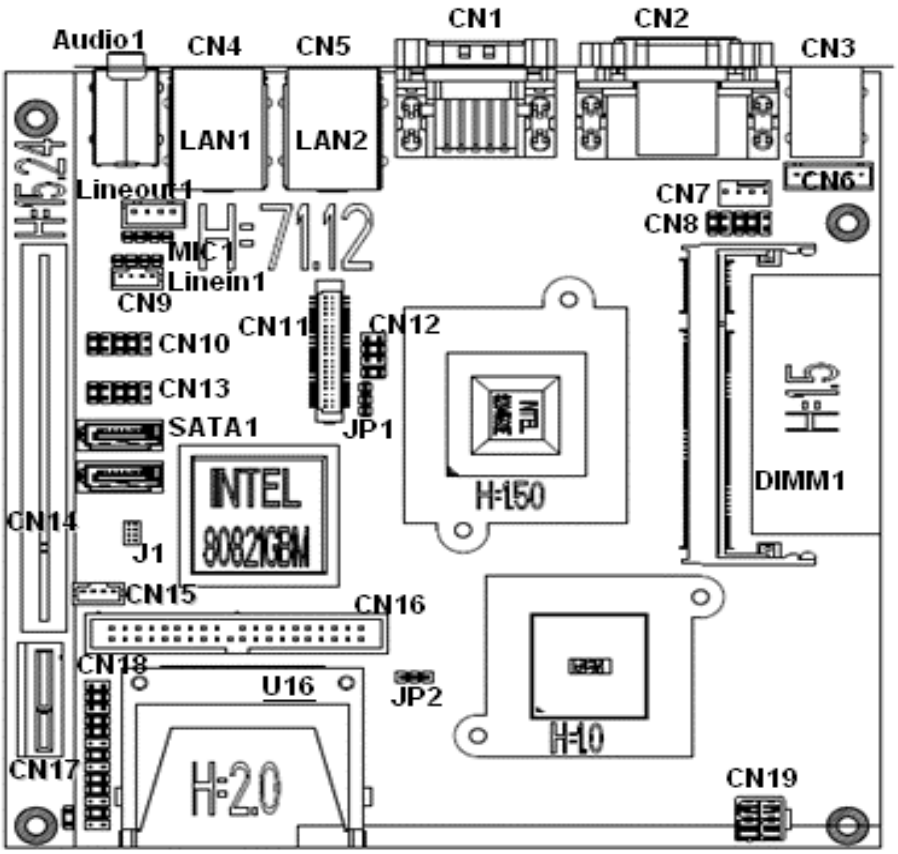


Figure 2-1 WADE-8170 Top-side Jumper and Connector Locations

JP1 : LVDS POWER SETTING

PIN No.	Description
1-2	3.3V Power ★
2-3	5V Power

JP2 : Clear CMOS

PIN No.	Description
1-2	Normal operation ★
2-3	Clear CMOS

JP3 : Auto Power On

PIN No.	Description
Non	★
1-2	Auto Power On

2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors

Connector Function List

Connector	Description	Remark
CN1	COM 1 2 RS-232 Serial Port Connector	
CN2	CRT VGA with DVI Port Connector	
CN3	PS/2 Key Mouse Connector	
CN4	USB 0 1+100/Giga LAN Connector	
CN5	USB 2 3+100/Giga LAN Connector	1 x 6 header
CN6	EXT. KB/MS	
CN7	Power Fan Connector	2 x 5 header
CN8	8 Bit Digital I/O interface	1 x 4 header
CN9	HDD Power Connector	9 Pin header
CN10	USB 4 5 Connector	
CN11	LVDS Connector	2 x 4 header
CN12	TV Connector	9 Pin header
CN13	USB 6 7 connector	
CN14	PCI Slot (PCI 1)	1 x 4 header
CN15	HDD Power Connector	
CN16	Primary IDE1 Connector	
CN17	PCI Express _1 Connector	

CN18	Front Panel System Connector	
CN19	DC IN Connector	
DIMM1	So Dimm	
STAT1	Serial ATA Port 1	
STAT2	Serial ATA Port 2	
U16	CF Card	
Audio1	AUDIO Connector	
Linein1	Front Panel Lineinor	1 x 4 header
Lineout1	EXT. Line Out Connector	
MIC1	MIC Connector	
CN20	HDD POWER Connector	1 x 4 header

Pin Assignments of Connectors

CN1 : COM1&2 RS-232 Serial Port Connector

PIN No.	Signal Description
1	Data Carrier Detect
2	Received Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator
10	Not used

CN2 : CRT VGA with DVI Port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Red Signal	2	Green Signal
3	Blue Signal	4	NC
5	Ground	6	Ground
7	Ground	8	Ground
9	+5V	10	Ground
11	NC	12	CRT_SDA
13	CRT_HS	14	CRT_VS
15	CRT_SCK	16	TDC2#
17	TDC2	18	GND
19	NC	20	NC
21	SC_DDC	22	SD_DDC

23	TDC1#	24	TDC1
25	NC	26	NC
27	DV15V	28	GND
29	DVI_DET	30	TDC0#
31	TDC0	32	GND
33	NC	34	TLC
35	TLC#		

CN3 : PS/2 Keyboard Mouse Connector

PIN No.	Signal Description
1	Keyboard Data
2	NC
3	Ground
4	+5V
5	Keyboard Clock
6	NC
7	Mouse Data
8	NC
9	Ground
10	+5V
11	Mouse Clock
12	NC
13	GND
14	GND
15	GND
16	GND
17	GND

CN4 : USB 0 1+100/Giga LAN Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC5V	2	USB0-
3	USB0+	4	GND
5	VCCV	6	USB1-
7	USB1+	8	GND
9	GND	10	GND
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND
17	GND	18	MDI0+
19	MDI0-	20	MDI1+
21	MDI1-	22	MDI2+
23	MDI2-	24	MDI3+
25	MDI3-	26	GND
27	LINK1	28	ACT1
29	100-	30	1000-

CN5 : USB 2 3+100/Giga LAN Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC5V	2	USB2-
3	USB2+	4	GND
5	VCCV	6	USB3-
7	USB3+	8	GND
9	GND	10	GND
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND
17	GND	18	MDI0+
19	MDI0-	20	MDI1+
21	MDI1-	22	MDI2+
23	MDI2-	24	MDI3+
25	MDI3-	26	GND
27	LINK1	28	ACT1
29	100-	30	1000-

CN6 : EXT. KB/MS

PIN No.	Signal Description	PIN No.	Signal Description
1	Mouse Clock	2	Mouse Data
3	Keyboard Clock	4	Keyboard Data
5	GND	6	DUAL_5V

CN7 : Power Fan Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	SENSE
4	Control (CN3 only)

COM8 : 8 Bit Digital I/O interface

PIN No.	Signal Description
1	EXT_VDD
2	ISO_I1
3	ISO_O1
4	ISO_I2
5	ISO_O2
6	ISO_I3
7	ISO_O3
8	ISO_I4
9	ISO_O4
10	EXT_VSS

CN9 : HDD Power Connector

PIN No.	Signal Description
1	+12V
2	GND
3	GND
4	VCC5V

CN10 : USB 4 5 Connector

PIN No.	Signal Description
1	VCC5 V
2	VCC5 V
3	USB4-
4	USB4+
5	USB5-
6	USB5+
7	Ground
8	Ground

CN11 : LVDS Connector

Description	PIN No.	PIN No.	Description
NC	1	2	NC
GND	3	4	GND
LVDS_DATAA0-	5	6	LVDS_DATAA1-
LVDS_DATAA0+	7	8	LVDS_DATAA1+
GND	9	10	GND
LVDS_DATAA2-	11	12	LVDS_CLKA-
LVDS_DATAA2+	13	14	LVDS_CLKA+
GND	15	16	GND
NC	17	18	LVDS_DATAB0-
NC	19	20	LVDS_DATAB0+
GND	21	22	GND
LVDS_DATAB1-	23	24	LVDS_DATAB2-
LVDS_DATAB1+	25	26	LVDS_DATAB2+
GND	27	28	GND
LVDS_CLKB-	29	30	NC
LVDS_CLKB+	31	32	NC
NC	33	34	+12V
NC	35	36	+12V
NC	37	38	VDD
LCD_BKL_EN	39	40	VDD

CN12 : TV Connector

PIN No.	Signal Description
1	GND
2	GND
3	TVDAC_B
4	TVDAC_C
5	TVDAC_A
6	GND
7	NC
8	NC

CN13 : USB 6 7 Connector

PIN No.	Signal Description
1	VCC5 V
2	VCC5 V
3	USB6-
4	USB6+
5	USB7-
6	USB7+
7	Ground
8	Ground

CN15 : HDD Power Connector

PIN No.	Signal Description
1	+12V
2	GND
3	GND
4	VCC5V

CN16 : Primary IDE1 Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	IDERST-	2	Ground
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	Ground	20	NC
21	PDDREQ	22	Ground
23	PDIOW-	24	Ground
25	PDIOR-	26	Ground
27	PIORDY	28	Ground
29	PDDACK-	30	Ground
31	INTP	32	NC
33	PDA1	34	P66DET
35	PDA0	36	PDA2
37	PDCS-1	38	PDCS-3
39	IDEACTP-	40	Ground

CN18 : Front Panel System Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	5V	2	RESET+
3	IR_CRX	4	RESET-
5	IR_RX	6	NC
7	GND	8	SPKR
9	IR_TX	10	NC
11	NC	12	GND
13	HDLED+	14	5V
15	HDLED-	16	NC
17	TBLED+	18	PWLED+
19	TBLED-	20	NC
21	NC	22	PWLED-
23	PWRBT+	24	KBLOCK
25	PWRBT-	26	GND

CN19 : DC IN ATX Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	GND
3	+12V	4	+12V

AUDIO1 : Audio Connector

PIN No.	Signal Description	PIN No.	Signal Description
1(Orange)	Central out	4(Blue)	Line-in
2(Black)	Surround out	5(Green)	Line-out
3(Gray)	Side out	6(Red)	Mic-in

LINEIN1 : Front Panel Line-in

PIN No.	Signal Description
1	CDIN_L
2	CDGND
3	CDGND
4	CDIN_R

LINEOUT1 : EXT. Line-Out Connector

PIN No.	Signal Description
1	LOUT_L
2	GND
3	JD1
4	LOUT_R

MIC1 : MIC Connector

PIN No.	Signal Description
1	MIC2_1
2	CDGND
3	CDGND
4	MIC2_2

CN20 : HDD POWER Connector

PIN No.	Signal Description
1	+12V
2	GND
3	GND
4	VCC5V

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® ATOM CPU

WADE-8170 onboard uses Intel Atom N270 CPU 1.6GHz processor. Introducing Intel Atom processor, a new microprocessor designed from the ground up for mobility, with a mobile-optimized chipset. Intel mobile processor innovative design techniques allow faster execution of instructions at lower power.

3.2 Main Memory

WADE-8170 provide 1 x 200-pin SO-DIMM sockets which supports 667/533 DDR2-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory size can be up to 2GB capacity. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be either one double-sided DIMM in either one DIMM socket or two single-sided SO-DIMM in both sockets.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

CPU FSB	Bandwidth
533MHz	4.2GB/s

Memory Frequency	Single Channel DDR Bandwidth
667MHz	4.2GB/s
533 MHz	4.2GB/s

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade system performance without acquiring technical information.

Memory frequency / CPU FSB synchronization

WADE-8170 supports different memory frequencies depending on the CPU front side bus and the type of DDR2 SO-DIMM.

CPU FSB	Memory Frequency
533 MHz	667/533MHz

3.3 Installing the Single Board Computer

To install your WADE-8170 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8170 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.7 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

The chipset on WADE-8170 is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8170 CD-title.

3.3.2 Intel Integrated Graphics GMCH Chip

Using Intel® 945GSE GMCH with Media Accelerator (GMA) 950 graphics integrated chipset is aimed to gain an outstanding graphic performance. Shared 8 accompany it to 128MB system DDR2-SDRAM with Total Graphics Memory. This combination makes WADE-8170 an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI-Express by 1 VGA card can take over the system display.

Drivers Support

Please find Springdale GMCH driver in the WADE-8170 CD-title. Drivers support Windows-2000, Windows XP.

3.3.3 Realtek Gigabit Ethernet Controller

Drivers Support

Please find Realtek RTL8111C LAN driver in /Ethernet directory of WADE-8170 CD-title. The drivers support Windows 2000 /XP.

LED Indicator (for LAN status)

WADE-8170 provides two LED indicators to report Realtek RTL8111C Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

<table>
<tr><th rowspan="2">8111C</th><th rowspan="2">Color</th><th rowspan="2">Name of LED</th><th colspan="3">Operation of Ethernet Port</th></tr>
<tr><th colspan="2">Linked</th><th>Active</th></tr>
<tr><td>Status LED</td><td>Orange</td><td>LAN Linked & Active LED</td><td colspan="2">On</td><td>Blinking</td></tr>
<tr><td rowspan="2">Speed LED</td><td>Orange</td><td rowspan="2">LAN speed LED</td><td>Giga Mbps</td><td>100 Mbps</td><td>10 Mbps</td></tr>
<tr><td>Green</td><td>Orange</td><td>Green</td><td>Off</td></tr>
</table>

3.3.4 Audio Controller

Please find Realtek ALC655 Audio driver form WADE-8170 CD-title. The drivers support Windows 2000 /XP.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

Clear CMOS (JP2)

PIN No.	Description
1-2	Normal operation ★
2-3	Clear CMOS

3.5 WDT Programming Guide

The Watchdog Timer of motherboard consists of 8-bit programmable time-out counter and a control and status register.

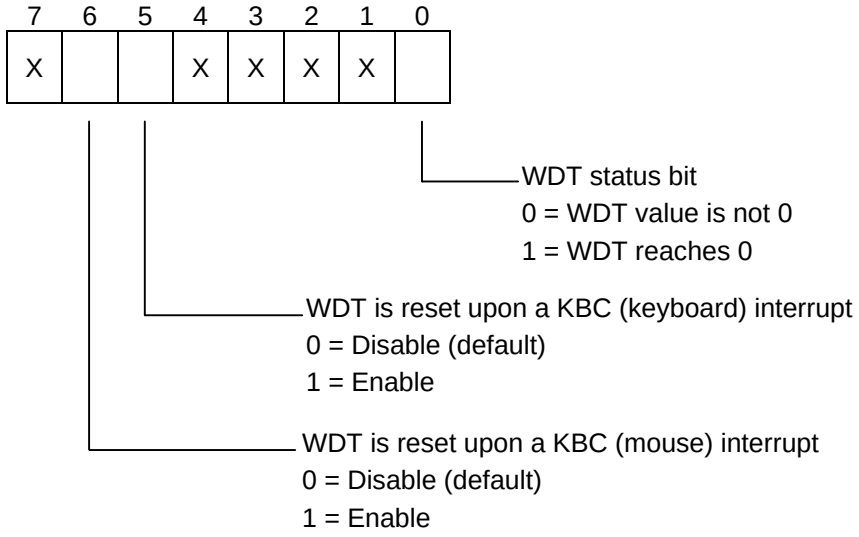
WDT Controller Register
There are two PNP I/O port addresses that can be used to configure WDT.

2Eh: EFIR (Extended Function Index Register, for identifying CR index number)
2Fh: EFDR (Extended Function Data Register, for accessing desired CR)

WDT control Register

Register Location: CR 71h
Attribute: Read / Write
Size: 8bit

BIT	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Attribute	Reserved	R/W	R/W	Reserved	Reserved	Reserved	Reserved	R/W


7 6 5 4 3 2 1 0
X X X X X
WDT status bit
0 = WDT value is not 0
1 = WDT reaches 0
WDT is reset upon a KBC (keyboard) interrupt
0 = Disable (default)
1 = Enable
WDT is reset upon a KBC (mouse) interrupt
0 = Disable (default)
1 = Enable

WDT Configuration Register

Register Location: CR 72h

Attribute: Read/Write

Size: 8bit

BIT	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Attribute	R/W	1	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

7	6	5	4	3	2	1	0
	1	X	X	X	X	X	X

Select WDT count mode
0 = Minute Mode (default)
1 = Second Mode

WDT Time-Out Value Register

Register Location: CR 73h

Attribute: Read / Write

Size: 8bit

BIT	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Attribute	Read/Write							

7	6	5	4	3	2	1	0

Watch Dog Timer Time-out value
00h: Time-out Disable (default)
01h: Time-out occurs after 1 second/minute
02h: Time-out occurs after 2 seconds/minutes
…
FFh: Time-out occurs after 255 seconds/minutes

WDT Control Command Example

Use DEBUG.EXE program under DOS or Windows 98

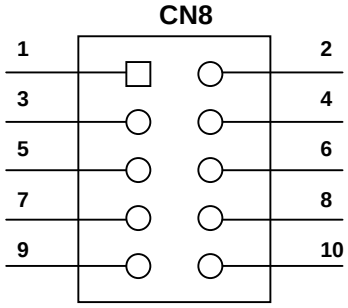
Command	WDT	Note
O 2E 87 O 2E 01 O 2E 55 O 2E 55		Enter Extended Function Mode
O 2E 07 O 2F 07		Select Logic Device 7
O 2E 72 O 2F C0		Second Mode
O 2E 73 O 2F 05	5 seconds	Specify Time-out Value
O 2E 02 O 2F 01		Exit Extended Function Mode

3.6 GPIO

GPIO Programming Guide

The motherboard provides 4 input / output ports that can be individually configured to perform a simple basic I/O function.

GPIO Pin Assignment



Pin	Signal	default	Pin	Signal	default
1	5V		2	DI1	high
3	DO1	low	4	DI2	high
5	DO2	low	6	DI3	high
7	DO3	low	8	DI4	high
9	DO4	low	10	GND	

GPIO Controller Register

The control for the GPIO signals is handled through a separate 2-byte I/O space.

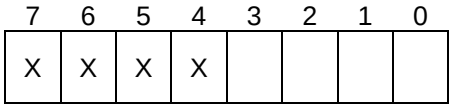
DI0 ~ DI3 Level for Input Register

Register Location: A22h

Attribute: Read

Size: 8bit

BIT	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Attribute	Reserved	Reserved	Reserved	Reserved	Read	Read	Read	Read



DI1 reflects the state of the input signal
0 = Low
1 = High (default)

DI2 reflects the state of the input signal
0 = Low
1 = High (default)

DI3 reflects the state of the input signal
0 = Low
1 = High (default)

DI4 reflects the state of the input signal
0 = Low
1 = High (default)

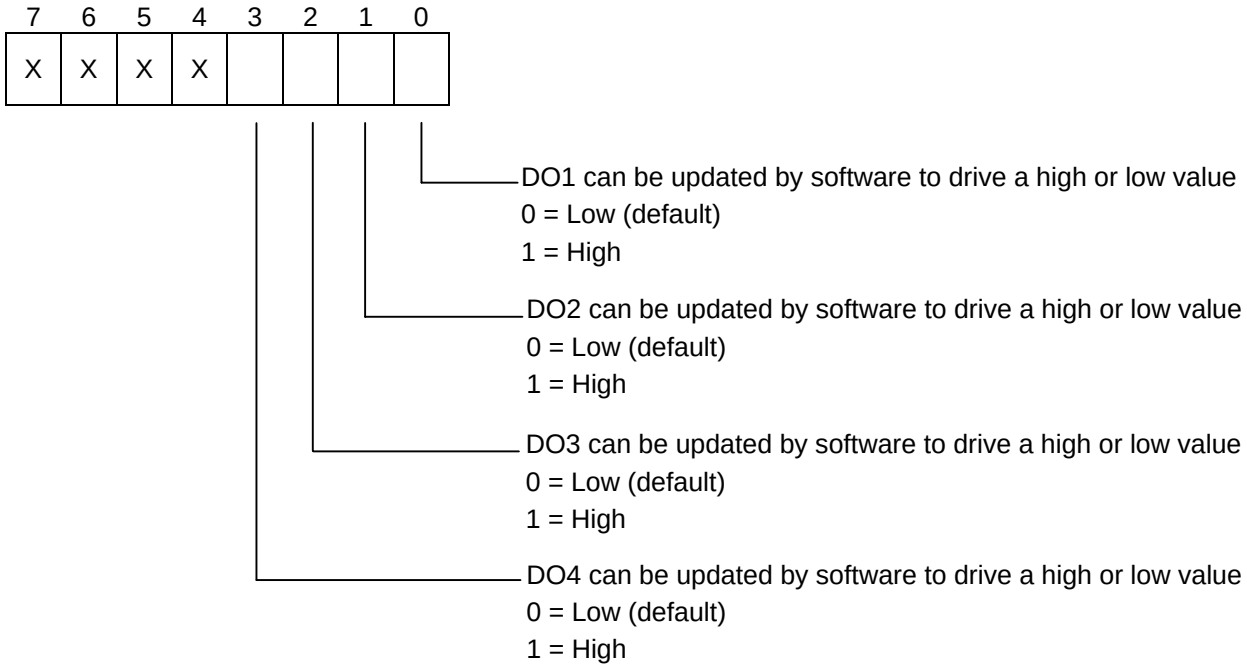
DO0 ~ DO3 Level for output Register

Register Location: A21h

Attribute: Read / Write

Size: 8bit

BIT	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Attribute	Reserved	Reserved	Reserved	Reserved	R/W	R/W	R/W	R/W


7 6 5 4 3 2 1 0
X X X X
DO1 can be updated by software to drive a high or low value
0 = Low (default)
1 = High
DO2 can be updated by software to drive a high or low value
0 = Low (default)
1 = High
DO3 can be updated by software to drive a high or low value
0 = Low (default)
1 = High
DO4 can be updated by software to drive a high or low value
0 = Low (default)
1 = High

GPIO Control Command Example (C Language)

Command	GPIO	Note

int iret = 0;
iret = inportb(0xA22);
iret = iret & 0x01;
if (iret == 0x01) {//hi}
	Check DI1 status	if bit0 = 1 then DI1 is high

iret = inportb(0xA21);
iret = iret | 0x01;
outportb(0xA21, iret);
	Set DO1 to high	bit0 = 1 for DO1 set to high

Chapter 4
BIOS Setup Information

WADE-8170 is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8170 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup - Launch System Setup

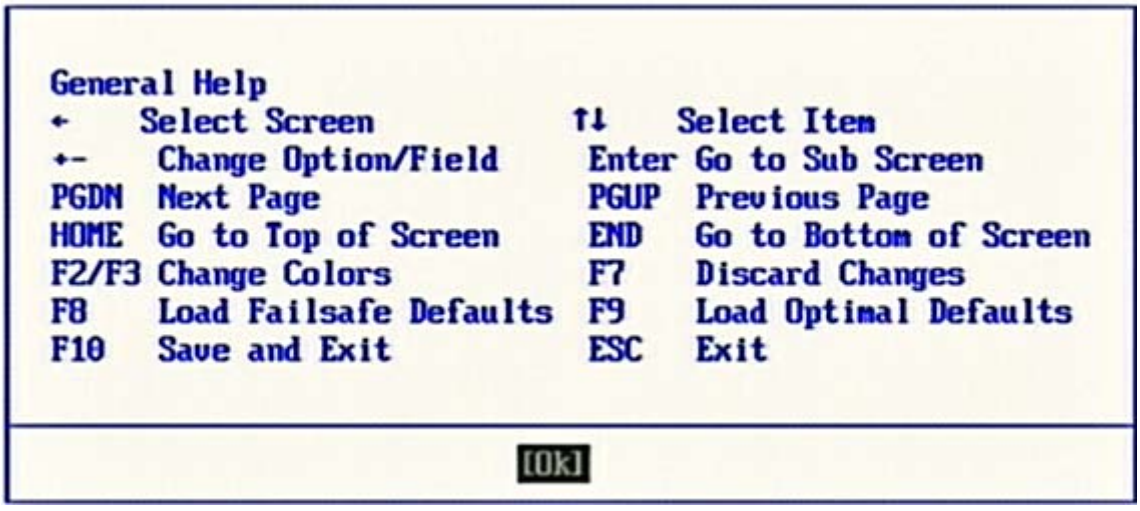
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key to enter Setup.

Press <Del> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

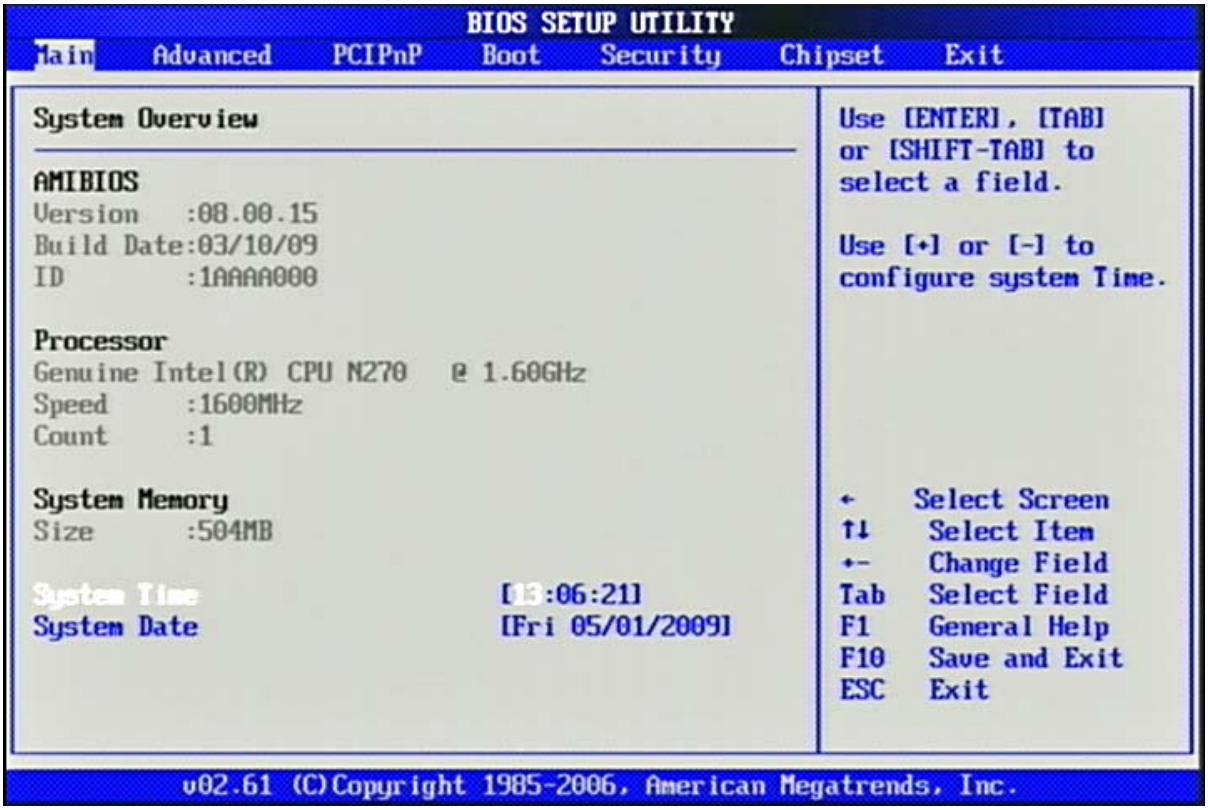
Press <F1> to Run SETUP or Resume

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



AMI BIOS, Processor, System Memory

These items show the firmware and hardware specifications of your system. Read only.

System Time

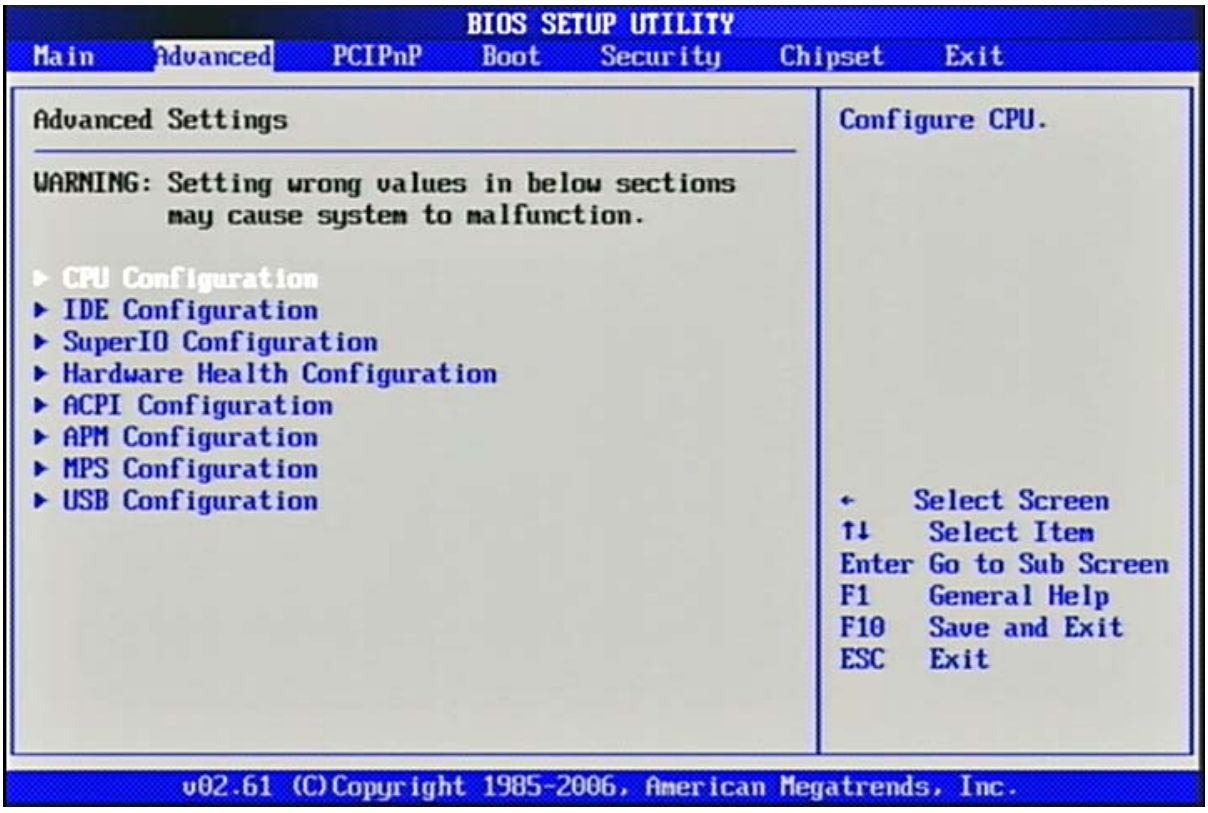
The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

System Date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

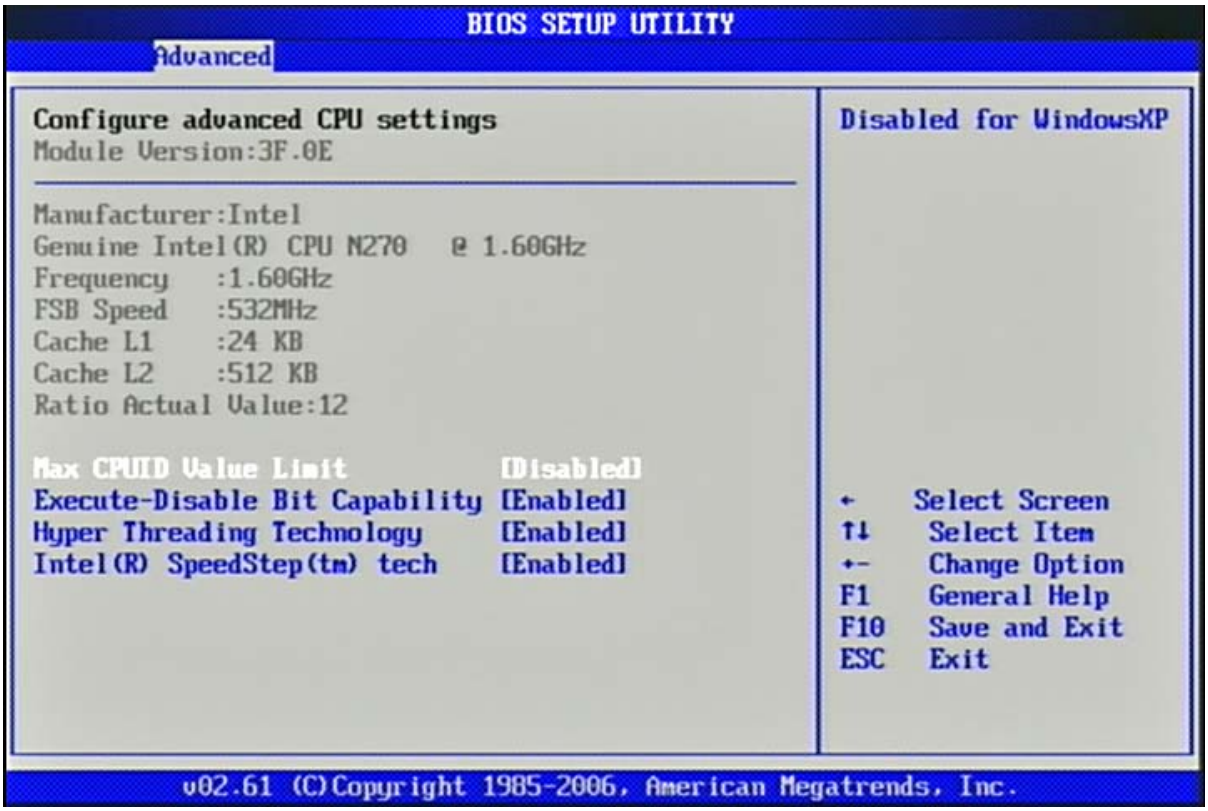
4.3 Advanced

Use this menu to set up the items of special enhanced features.



CPU Configuration

These items show the advanced specifications of your CPU. Read only.



Max CPUID Value Limit

Disabled for Windows XP

The choice: Disabled, Enabled.

Execute-Disable Bit capability

When disabled, force the XD feature flag to always return 0

The choice: Disabled, Enabled.

Hyper Threading Technology

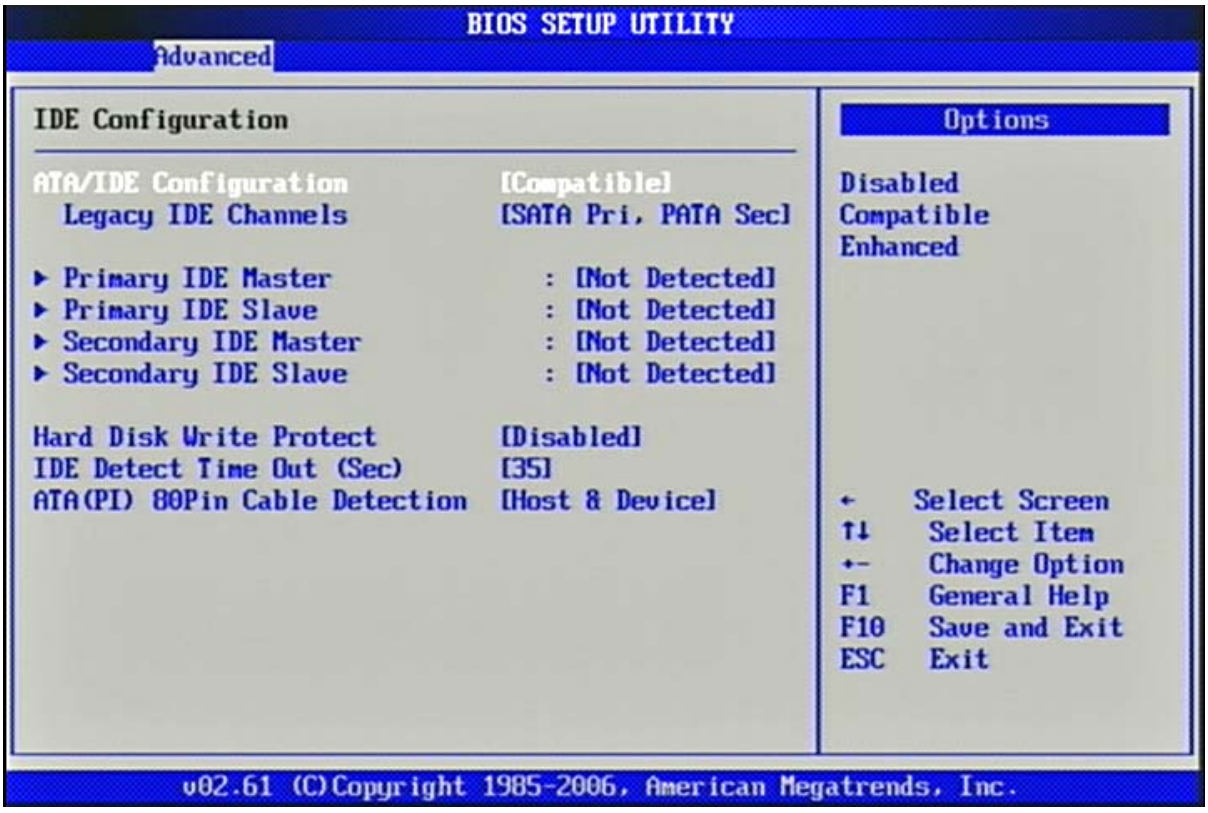
The choice: Disabled, Enabled.

Intel(R) Speed Step (tm) Tech

Disable: Disable GV3.
Enable: Enable GV3.

IDE Configuration

The IDE Configuration the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive (Master and Slave).

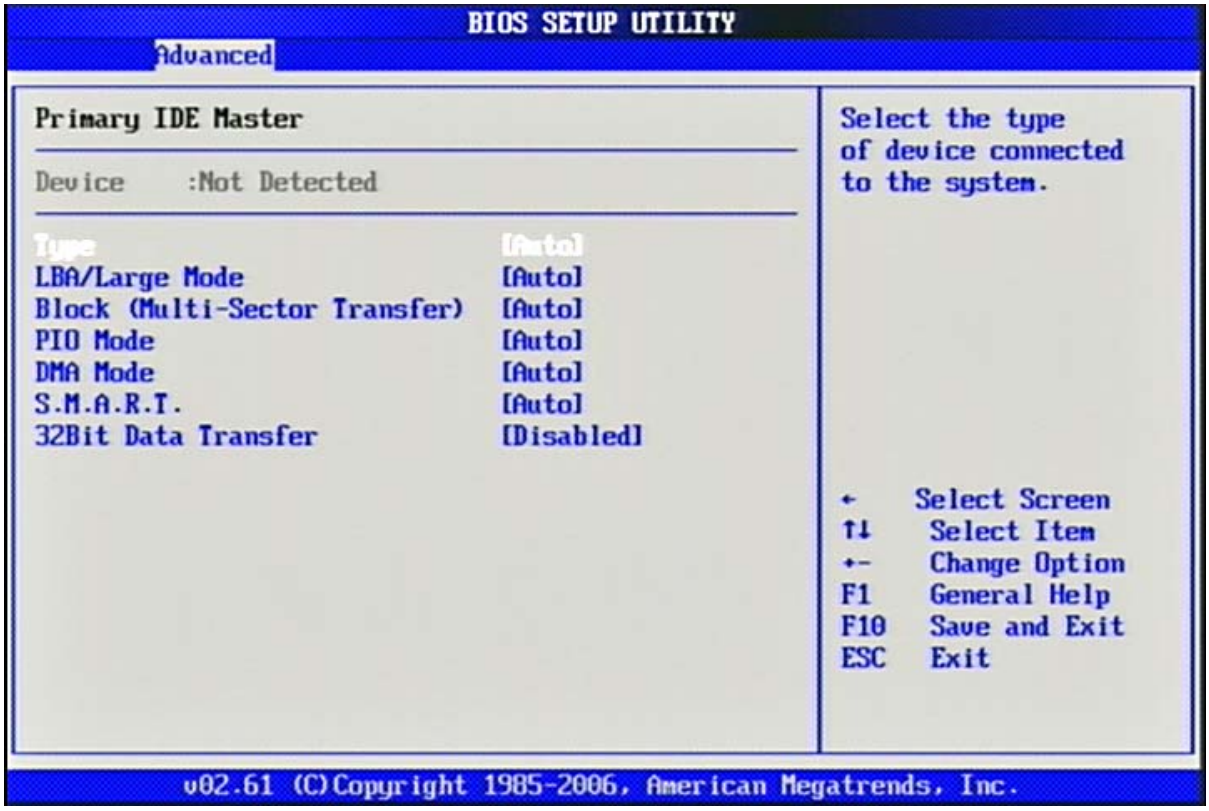


ATA/IDE Configuration

The choice: Disabled, Compatible, Enabled.

Primary/Secondary IDE Master / Slave

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



[Type] Press PgUp/<+> or PgDn/<—> to select [Manual], [None] or [Auto] type. You can use [Manual] to define your own drive type manually.

[LBA/Large Mode] Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.

[Block (Multi-Sector Transfer)] Any selection except Disabled determines the number of sectors transferred per block.

[PIO Mode] Indicates the type of PIO (Programmed Input/Output)

[DMA Mode] Indicates the type of Ultra DMA

[S.M.A.R.T.] This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

[32 Bit Data Transfer] Enable/Disable 32-bit Data Transfer.

Hard Disk Write Protect

Disabled/Enabled device write protection, this will be effective only if device is accessed through BIOS.

The choice: Disabled, Enabled.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ATAPI device (s).

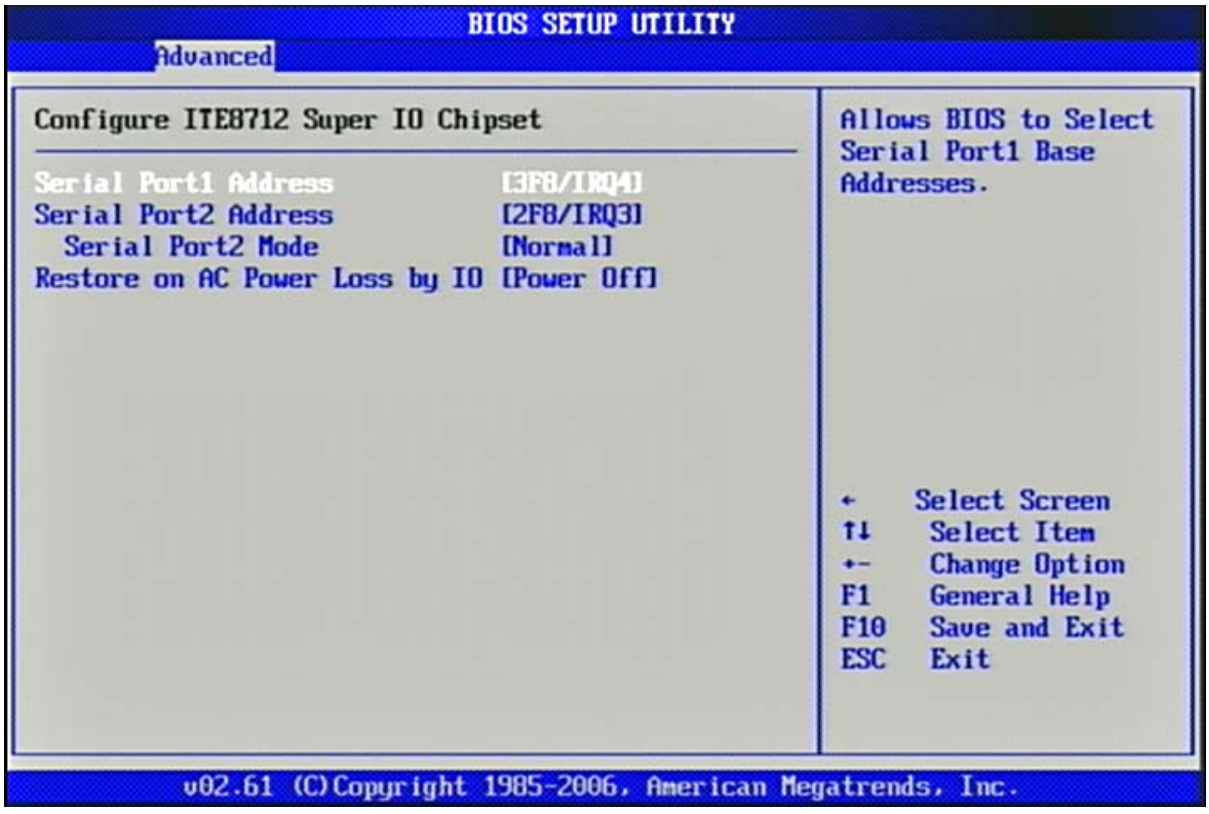
The choice: 0, 5, 10, 15, 20, 25, 30, 35.

ATA(PI) 80Pin Cable Detection

Select the mechanism for detecting 80Pin ATA (PI) cable.

The choice: Host & Device, Host, Device.

Super IO Configuration


BIOS SETUP UTILITY
Advanced
Configure ITE8712 Super IO Chipset
Serial Port1 Address [3F8/IRQ4]
Serial Port2 Address [2F8/IRQ3]
Serial Port2 Mode [Normal]
Restore on AC Power Loss by IO [Power Off]
Allows BIOS to Select Serial Port1 Base Addresses.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Serial Port 1 Address

Allows BIOS Select Serial Port1 Base Addresses.

The choice: Disabled, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3.

Serial Port 2 Address

Allows BIOS Select Serial Port2 Base Addresses.

The choice: Disabled, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3.

Serial Port 2 Address

Allows BIOS Select Serial Port2 Base Mode

The choice: Normal, IrDA, ASK IR.

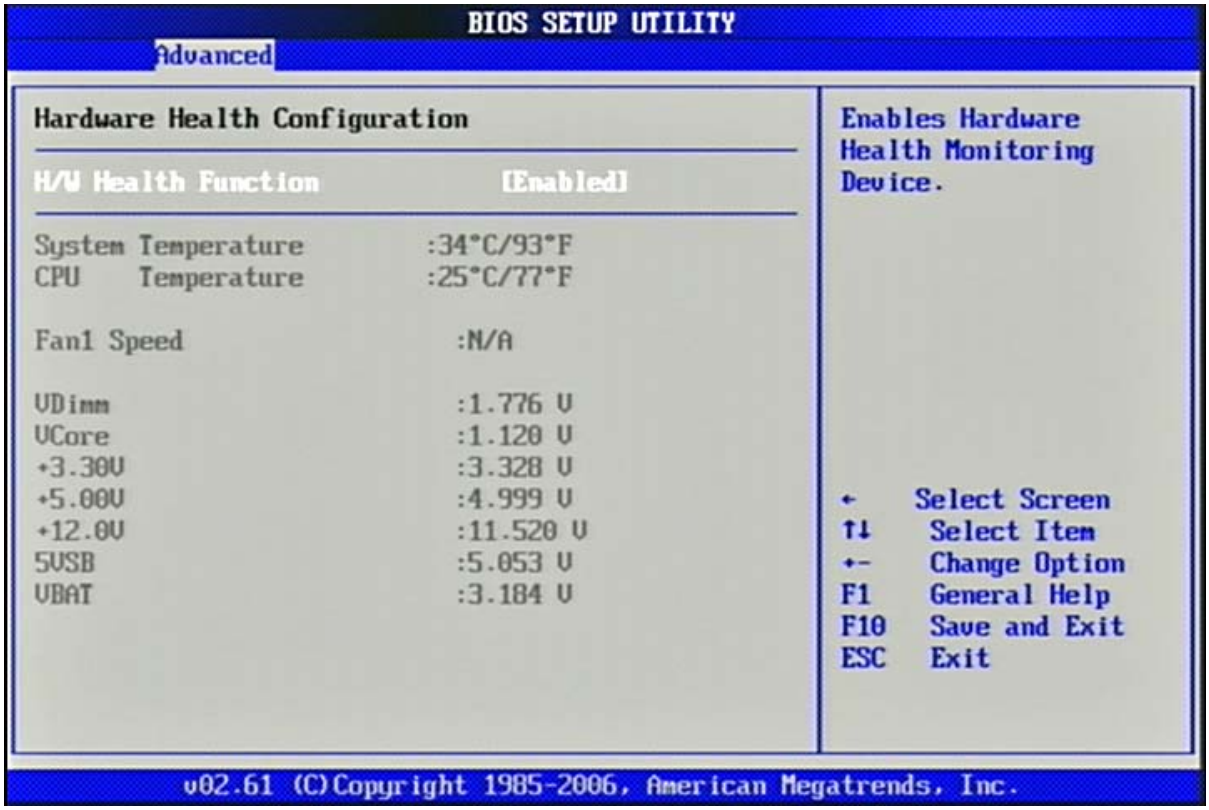
Restore on AC Power Loss by IO

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

The choice: Power Off, Power On, Last State.

Hardware Health Configuration

Configuration / monitor the Hardware Health.

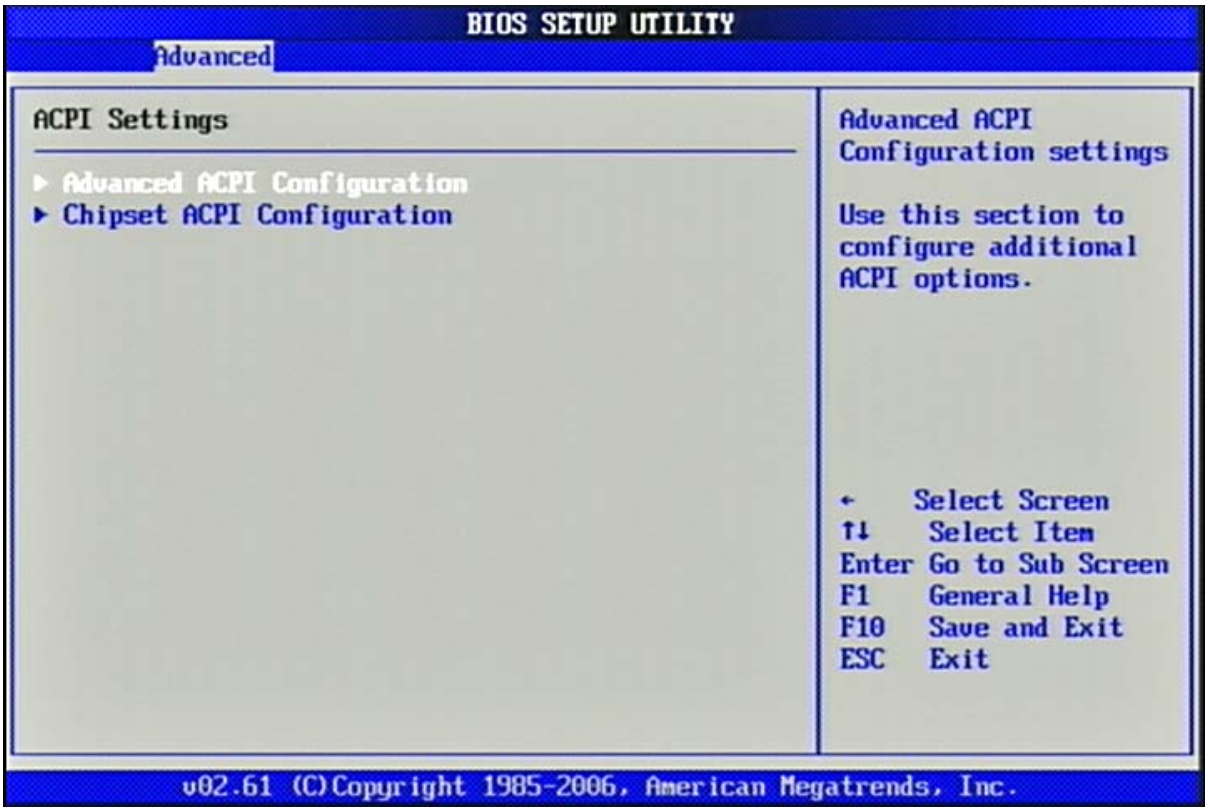


H/W Health Function

The choice: Disabled, Enabled.

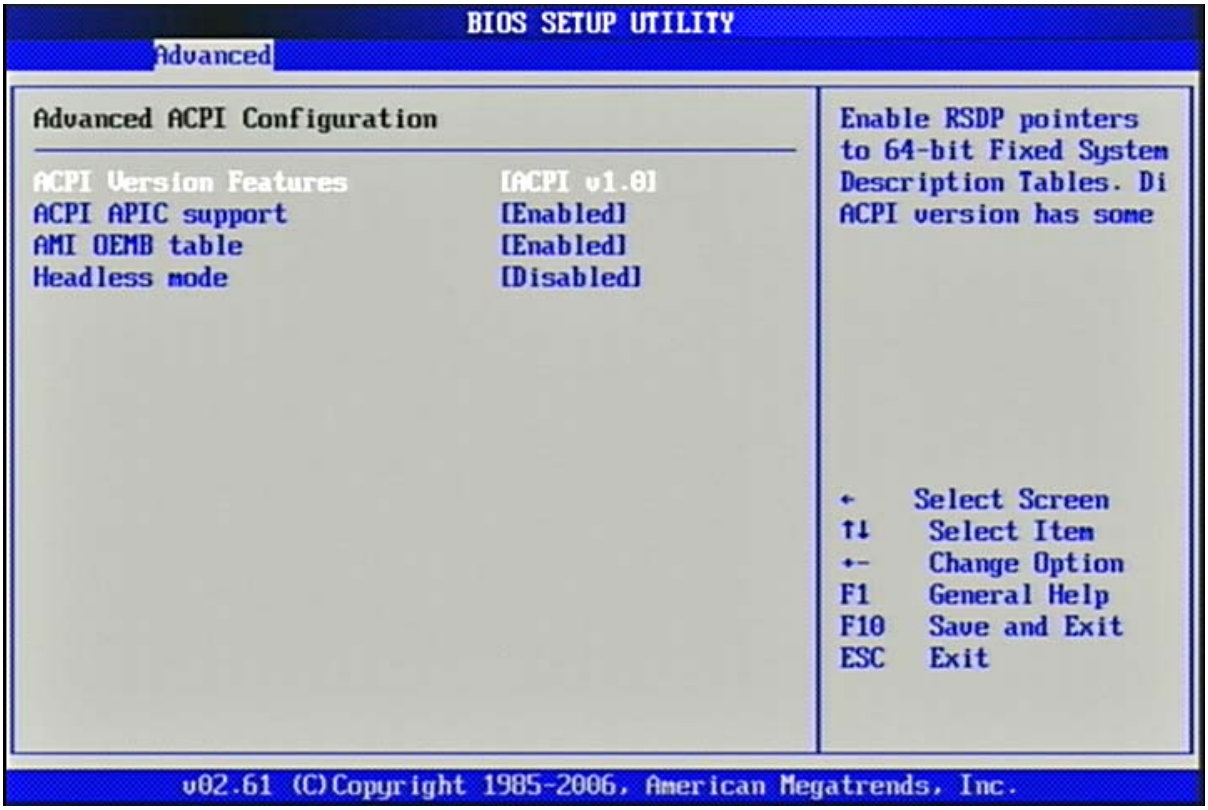
ACPI Settings

Select for Advanced ACPI Configuration.



Advanced ACPI Configuration

Advanced ACPI Configuration settings, Use this section to configure additional ACPI options.


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v1.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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ACPI Version Features

Enable RSDP pointers to 64-bit Fixed System Description Tables.

The choice: ACPI v1.0 / ACPI v2.0 / ACPI v3.0.

ACPI APIC support

Include ACPI APIC table pointer to RSDT pointer list.

The choice: Disabled, Enabled.

AMI OEMB table

Include OEMB table pointer to R(X) SDT pointer list.

The choice: Disabled, Enabled.

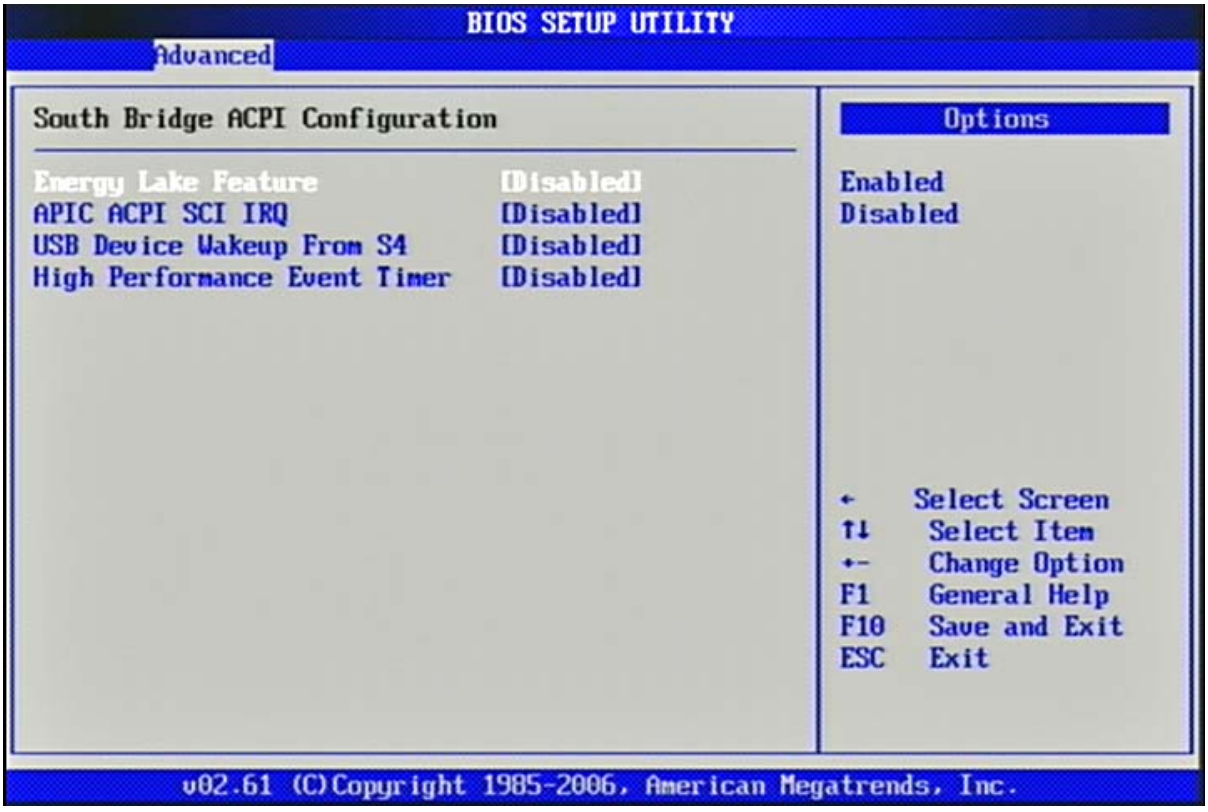
Headless mode

Enable / Disable Headless operation mode through ACPI.

The choice: Disabled, Enabled.

South Bridge ACPI Configuration

The South Bridge ACPI related Configuration settings, Use this section to configure additional ACPI options.



Energy Lake Feature

Select the ACPI state used for System Suspend.

The choice: Disabled, Enabled.

APIC ACPI SCI IRQ

Enable / Disable APIC ACPI SCI IRQ.

The choice: Disabled, Enabled.

USB Device Wakeup From S4

Enable / Disable USB device Wake from S4 mode.

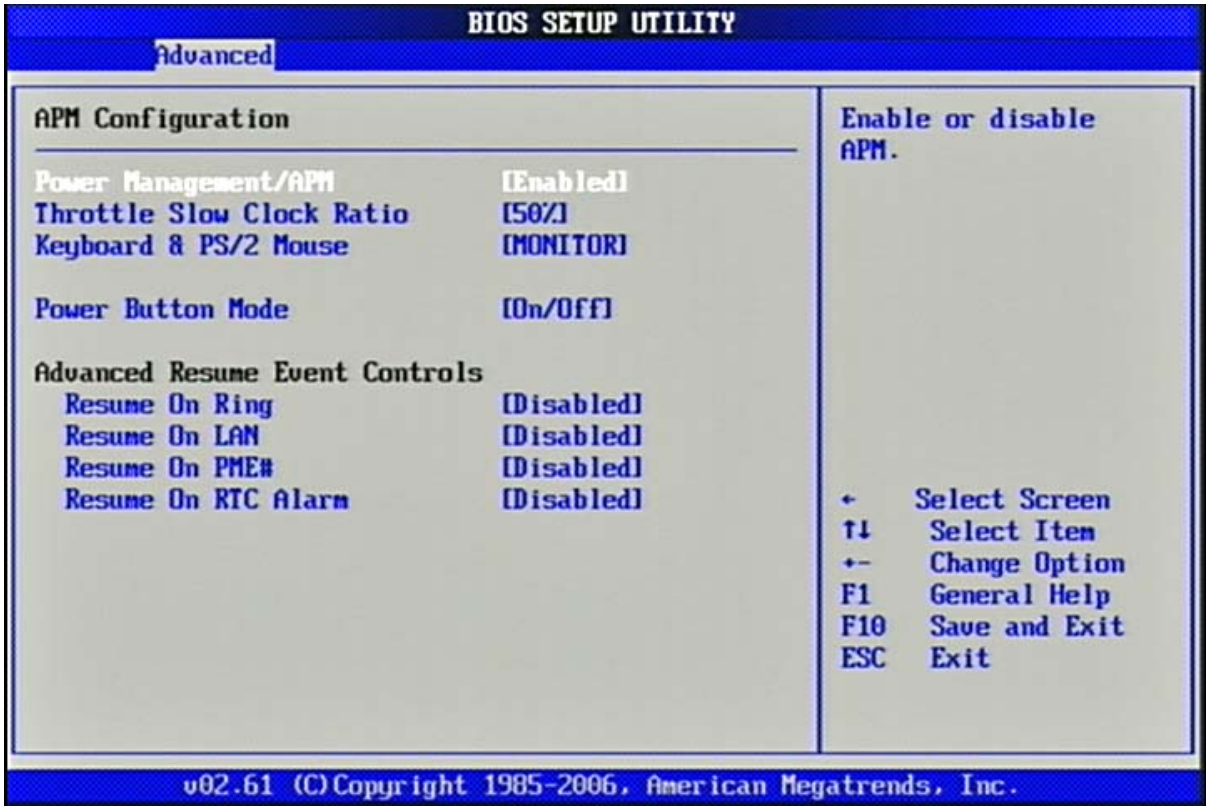
The choice: Disabled, Enabled.

High Performance Event Timer

The choice: Disabled, Enabled.

APM Configuration

Select for AHCI Configuration.



Power Management/APM

Enables for Power Management.

The choice: Disabled, Enabled.

Throttle Slow Clock Ratio

The choice: 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5%.

Keyboard & PS/2 Mouse

The choice: IGNORE, MONITOR.

Power Button Mode

The choice: On/Off, Suspend.

Resume On Ring

The choice: Disabled, Enabled.

Resume On LAN

The choice: Disabled, Enabled.

Resume On PME#

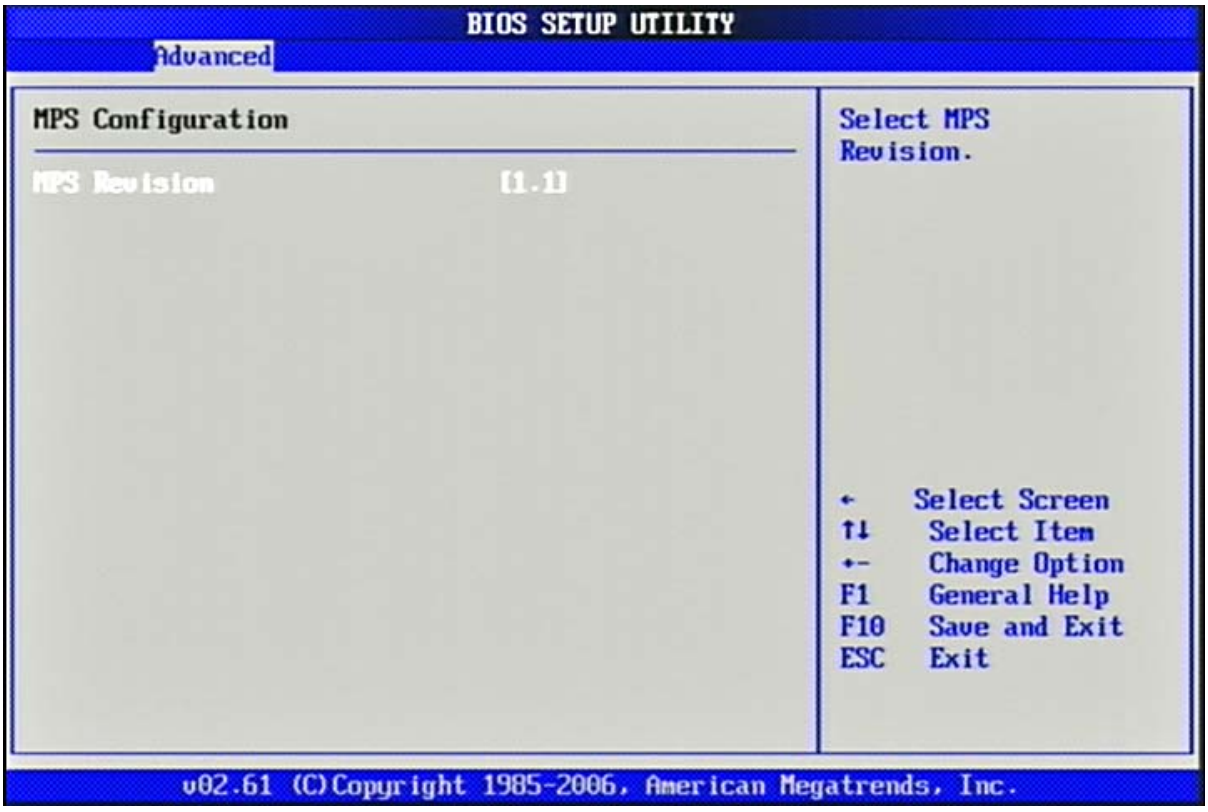
The choice: Disabled, Enabled.

Resume On RTC Alarm

The choice: Disabled, Enabled.

MPS Configuration

Configure the Multi-Processor Table.

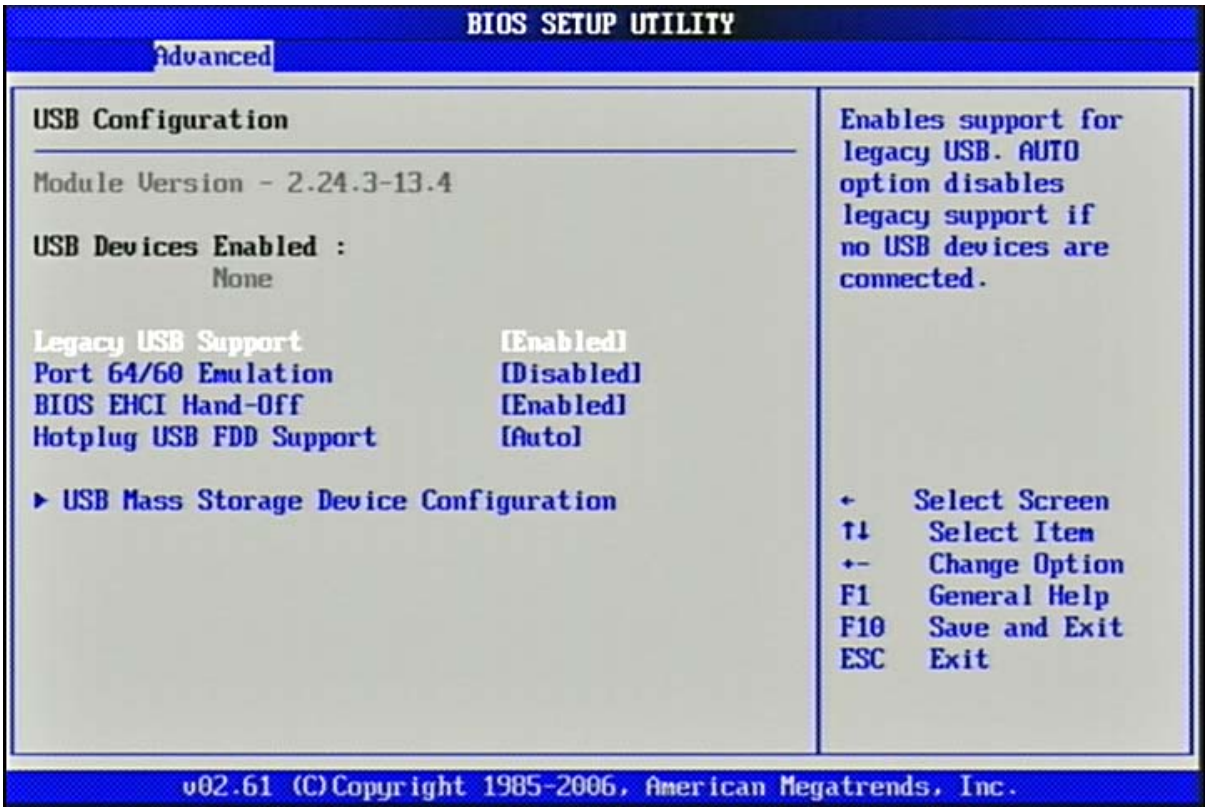


MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

The choice: 1.1, 1.4.

USB Configuration


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.3-13.4
USB Devices Enabled :
None
Legacy USB Support [Enabled]
Port 64/60 Emulation [Disabled]
BIOS EHCI Hand-Off [Enabled]
Hotplug USB FDD Support [Auto]
▶ USB Mass Storage Device Configuration
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Legacy USB Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

The choice: Disabled, Enabled, Auto.

Port 64/60 Hand-Off

Enable I/O port 60h/64h emulation support.

The choice: Disable, Enable.

BIOS EHCI Hand-Off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

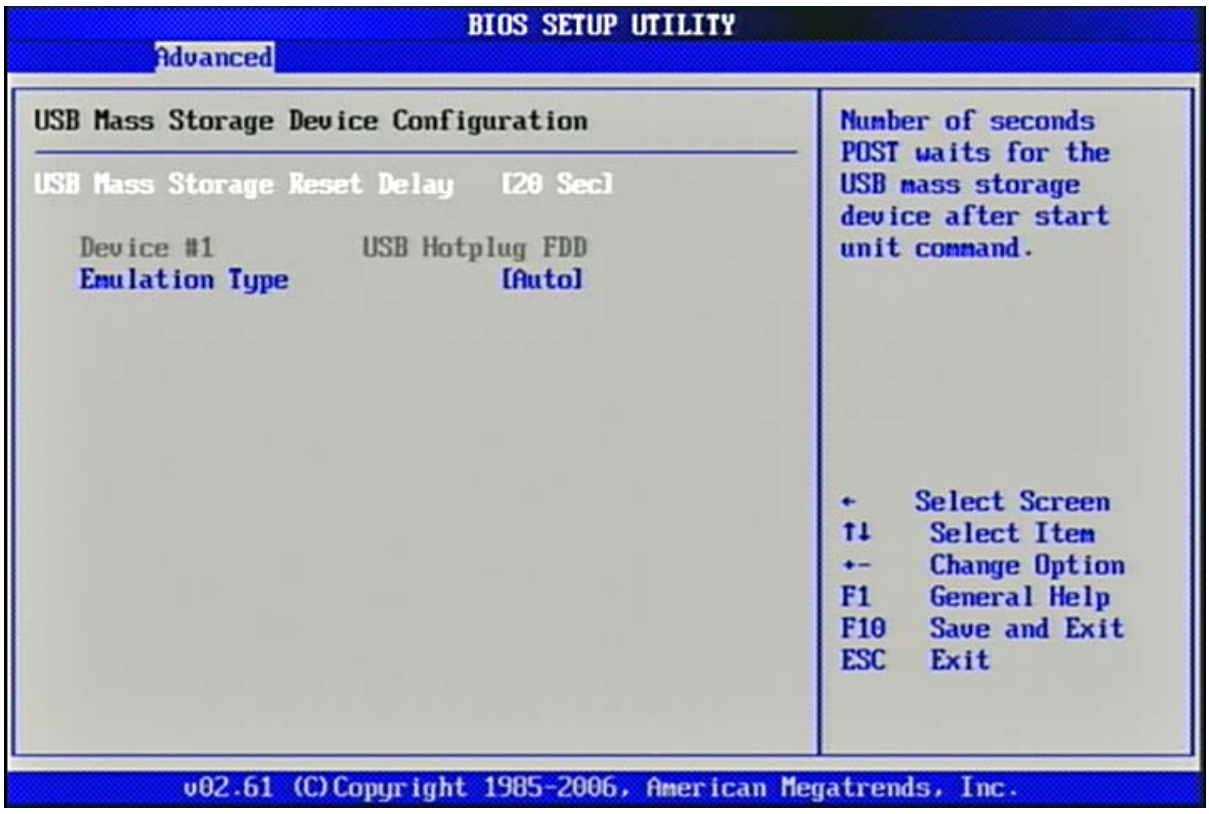
The choice: Disabled, Enabled.

Hotplug USB FDD Support

The choice: Disable, Enable, Auto.

USB Mass Storage Device Confuration

Configure the USB Mass Storage Class Devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 USB Hotplug FDD
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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USB Mass Storage Reset Delay

Number of seconds POST waits for the USB mass storage device after start unit command.

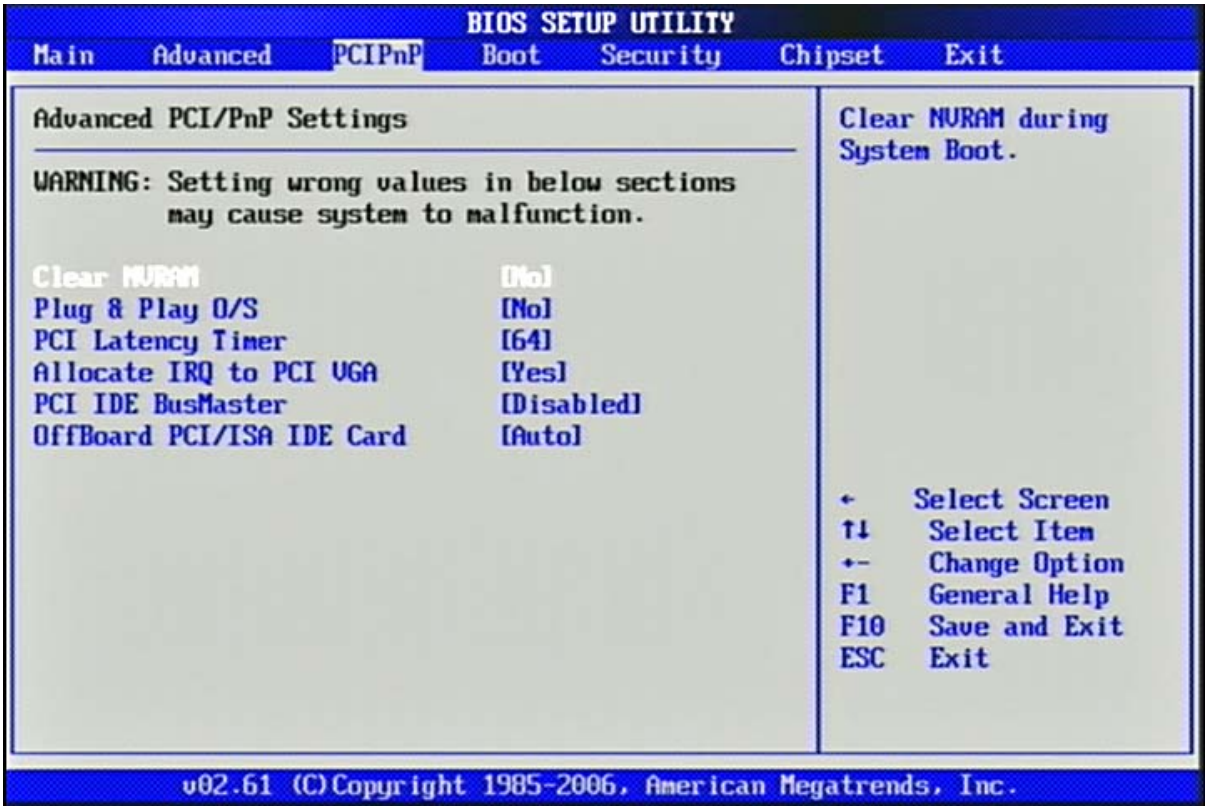
The choice: 10 Sec, 20 Sec, 30 Sec, 40 Sec.

Emulation Type

The choice: Auto, Floppy, Forced FDD, Hard Disk, CDROM.

4.4 PCIPnP

Advanced PCI/PnP setting wrong values in below sections may cause system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
Clear NVRAM [No]
Plug & Play O/S [No]
PCI Latency Timer [64]
Allocate IRQ to PCI VGA [Yes]
PCI IDE BusMaster [Disabled]
OffBoard PCI/ISA IDE Card [Auto]
Clear NVRAM during System Boot.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Clear NVRAM

Clear NVRAM during System Boot.

The choice: No, Yes.

Plug & Play O/S

No: lets the BIOS configure all the devices in the system.
Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

The choice: No, Yes.

PCI Latency Timer

Select value in units of PCI clocks for PCI device latency timer register.

The choice: 32, 64, 96, 128, 160, 192, 224, 248.

Allocate IRQ to PCI VGA

The choice: Yes, No.

PCI IDE BusMaster

Enabled: Uses PCI bus mastering for reading / writing to IDE drives.

The choice: Disabled, Enabled.

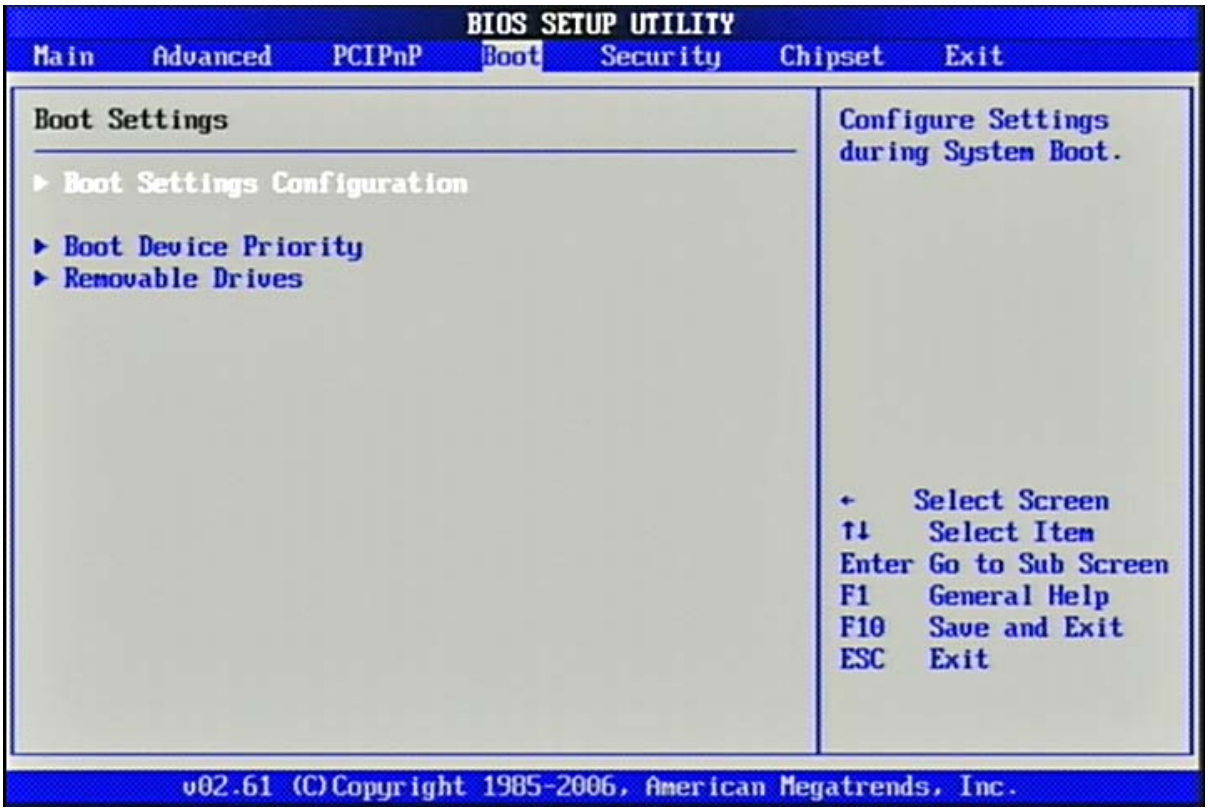
OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. AUTO: Works for most PCI IDE cards

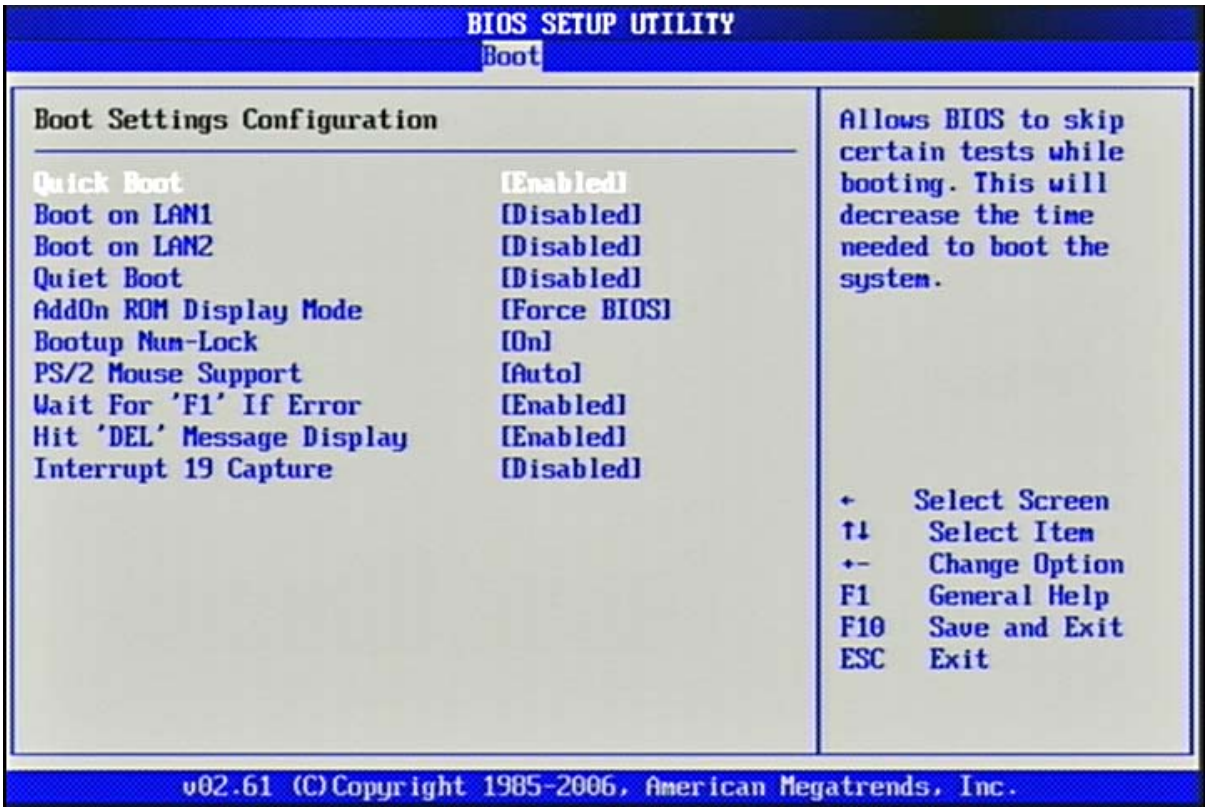
The choice: Auto, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, PCI Slot6.

4.5 Boot

Use this menu to specify the priority of boot devices.



Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Boot on LAN1 [Disabled]
Boot on LAN2 [Disabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during boot up for faster system boot.

The choice: Disabled, Enabled.

Boot on LAN1/LAN2

The choice: Disabled, Enabled.

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

The choice: Disabled, Enabled.

AddOn ROM Display Mode

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

The choice: Force BIOS, Keep Current.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

The choice: Off, On.

PS/2 Mouse support

Select [Enabled] if you need to use a PS/2-interfaced mouse in the operating system.

The choice: Disabled, Enabled, Auto.

Wait For 'F1' If Error

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

The choice: Disabled, Enabled.

Hit 'DEL' Message Display

Set this option to [Disabled] to prevent the message as follows:

Hit Del if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots. Set it to [Enabled] when you want to run the BIOS Setup Utility.

The choice: Disabled, Enabled.

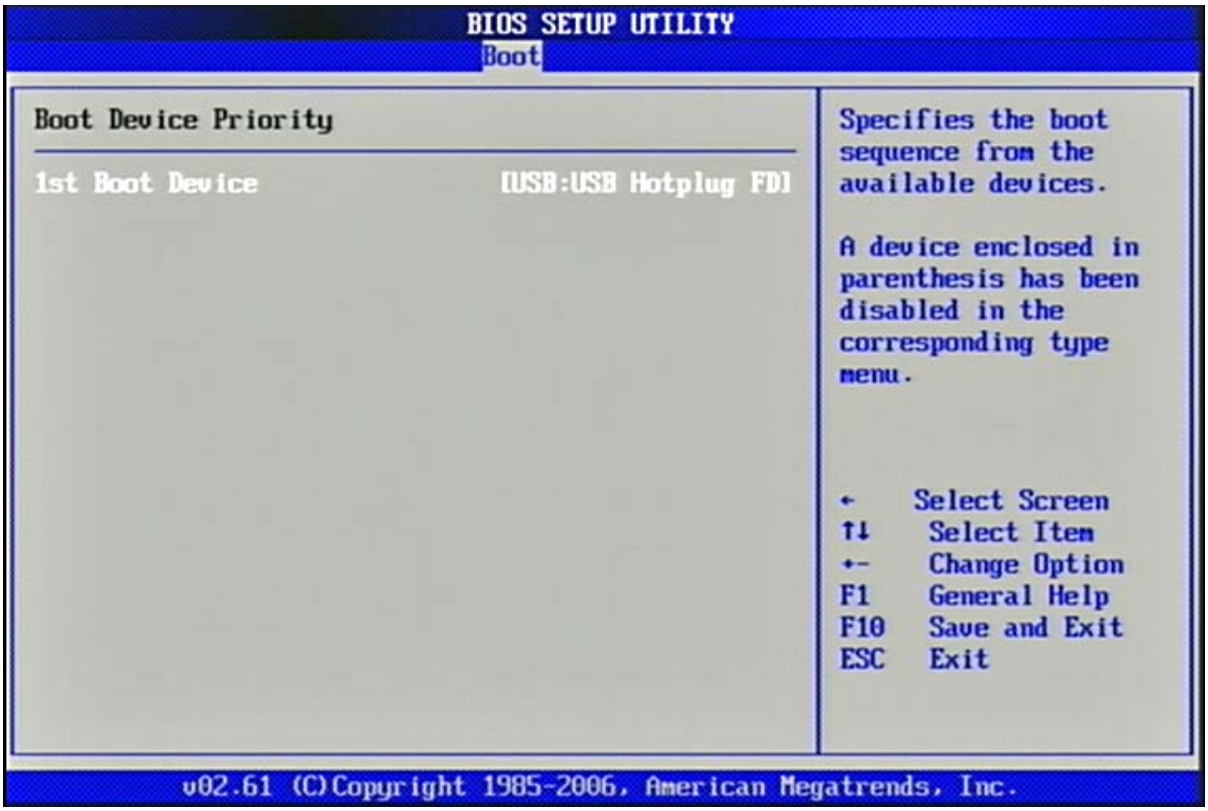
Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "cap ture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

The choice: Disabled, Enabled.

Boot Device Priority


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device
[USB:USB Hotplug FD]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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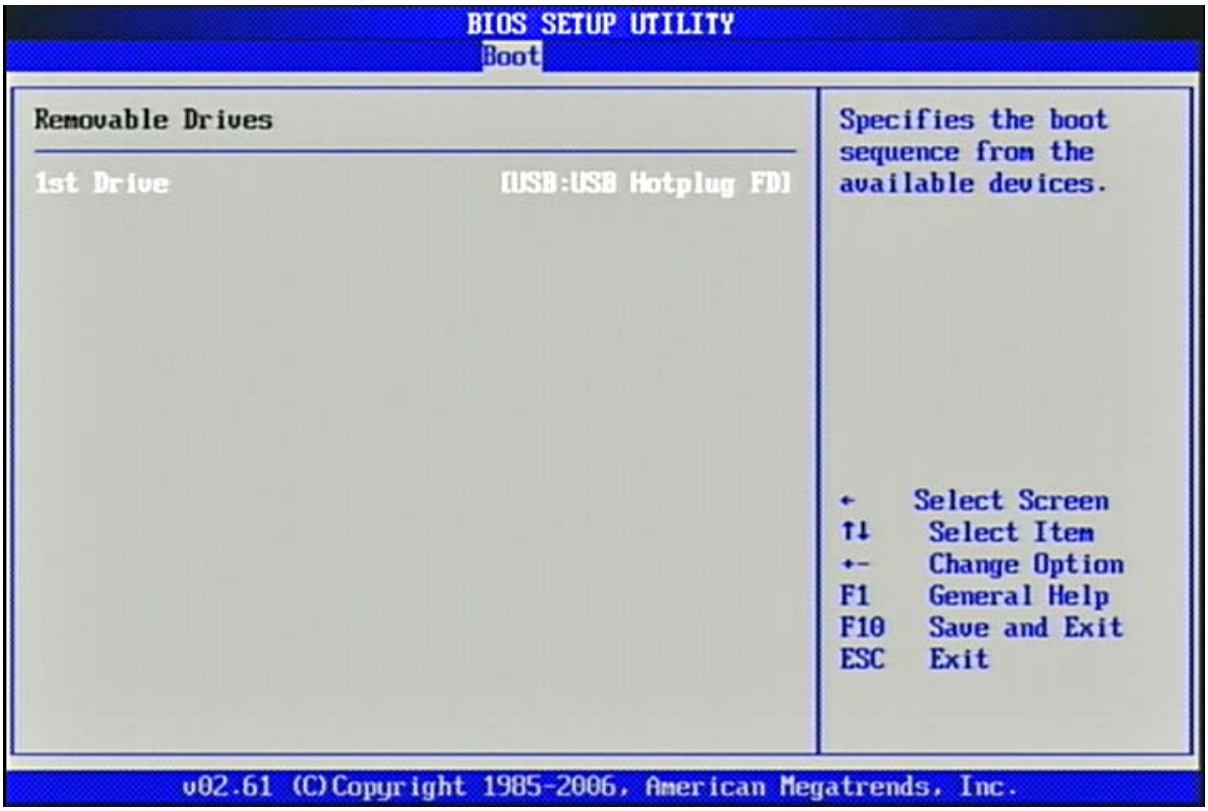
1st Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <—> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: (Network: IBA GE Slot 00C8 v1324), Disabled.

Removable Drives



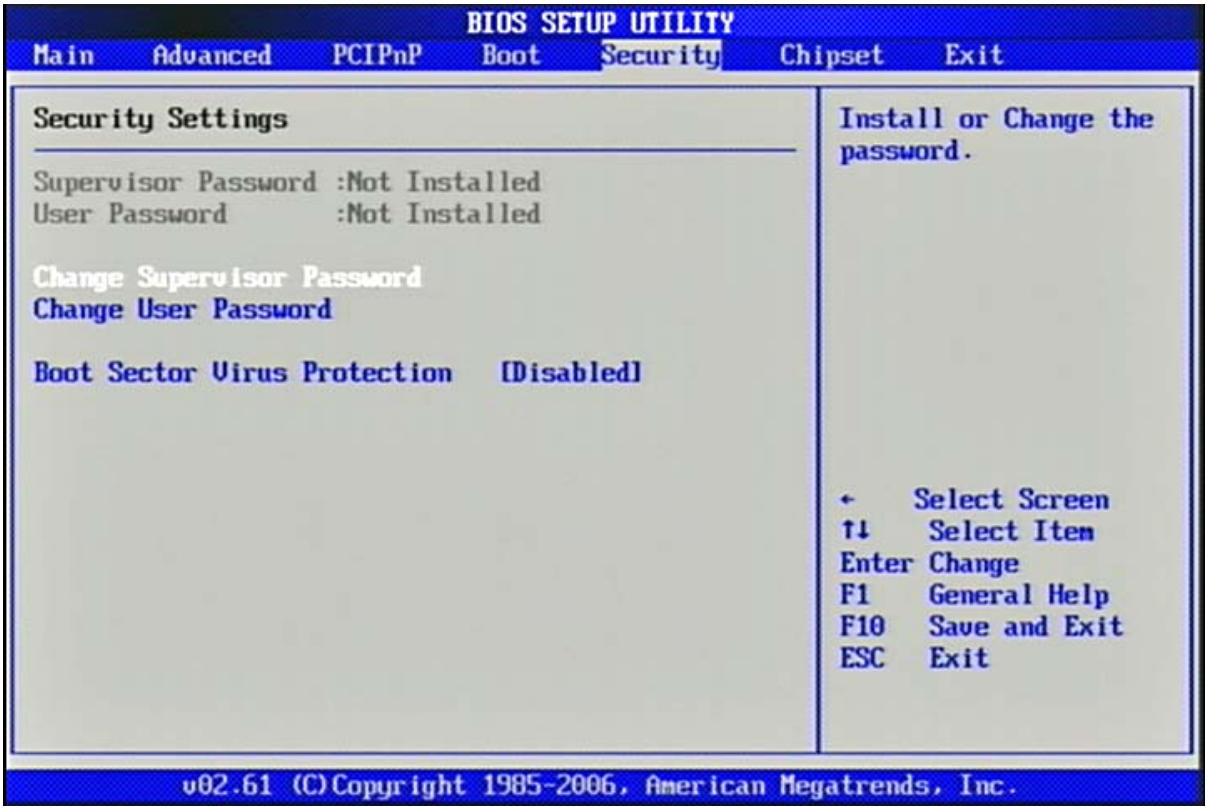
1st Drive

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <—> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: 1st FLOPPY DEVICE, Disabled.

4.6 Security

Use this menu to set supervisor and user passwords.



Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

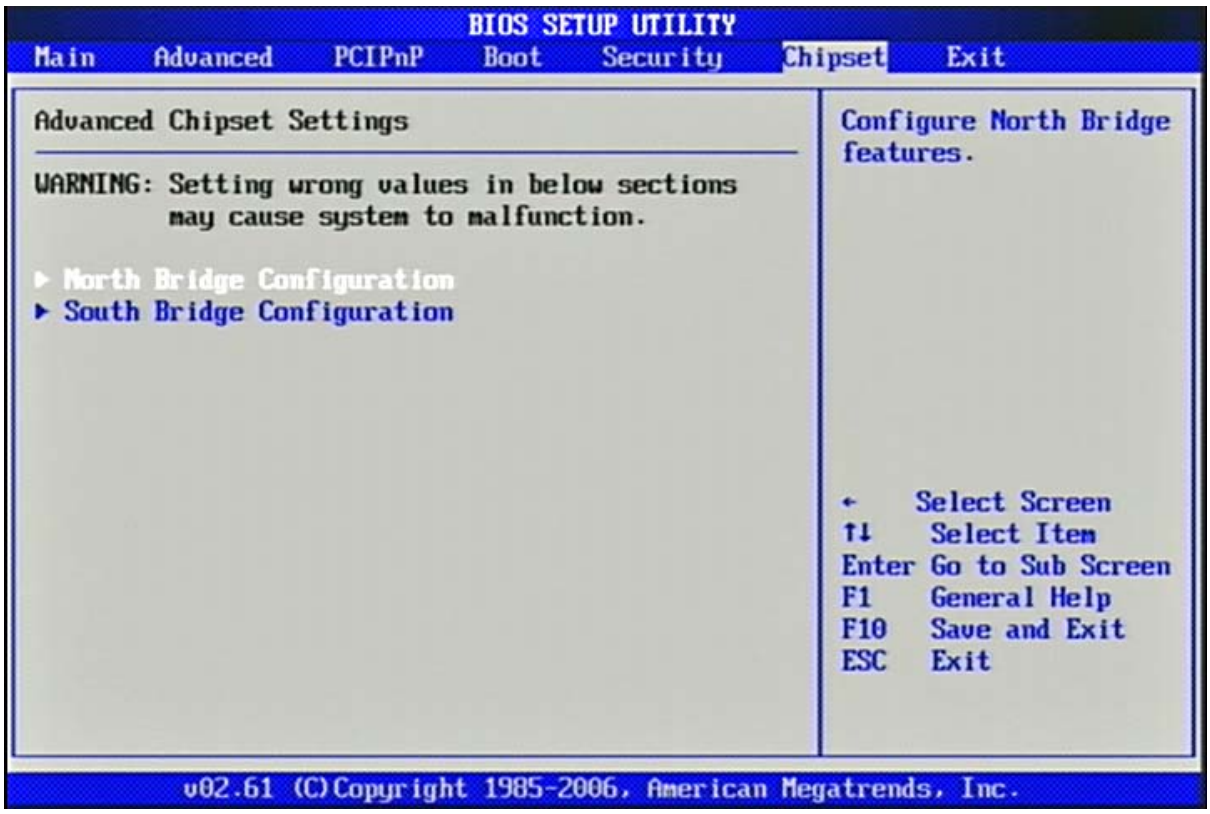
Boot Sector Virus Protection

Boot Sector Virus Protection.

The choice: Disabled, Enabled.

4.7 Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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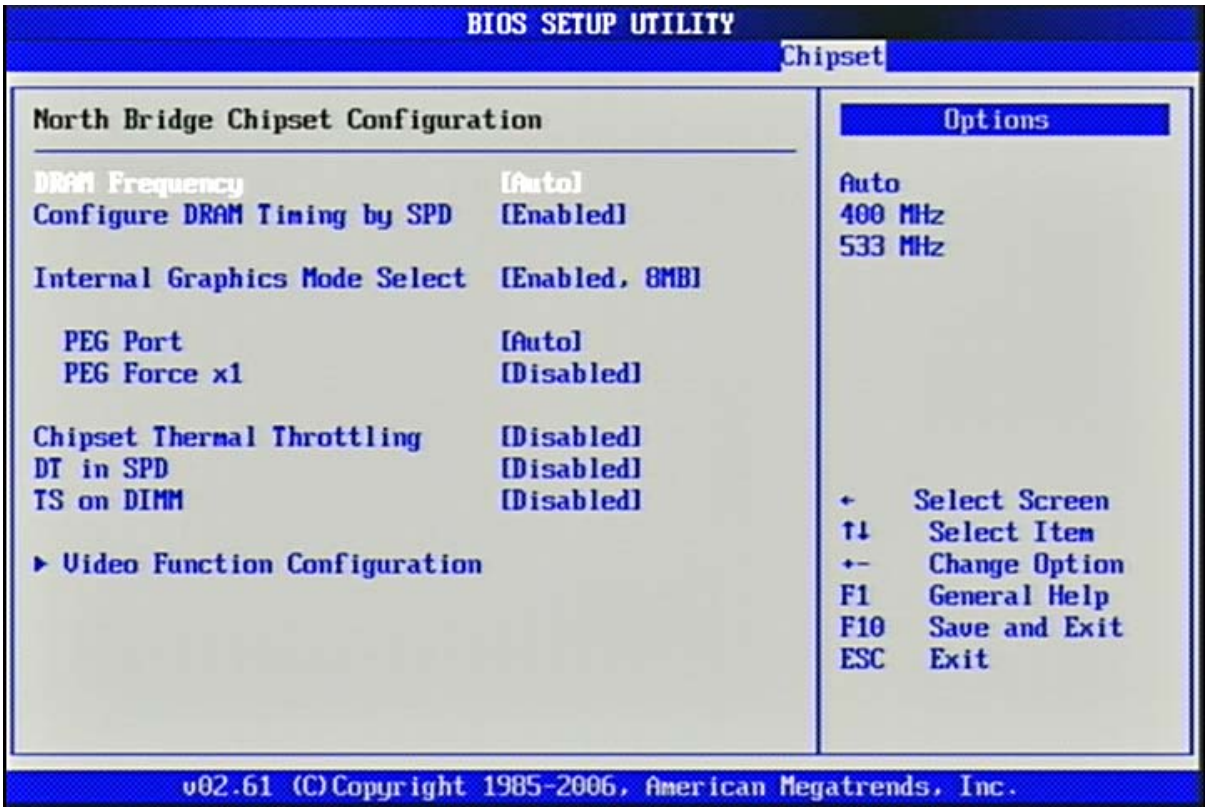
North Bridge Chipset Configuration



DRAM Frequency

The choice: Auto, 400 MHz, 533MHz.

Configure DRAM Timing by SPD

The choice: Disable, Enable.

Internal Graphics Mode Select

Select the amount of system memory used by the internal graphics device.

The choice: Disable, Enabled, 1MB, Enabled, 8MB.

PEG Port

This setting allows you to select whether to use the on-chip graphics processor or the PCI Express card. When set to [Auto], the BIOS checks to see if a PCI Express graphics card is installed. If it detects that a PCI Express graphics card is present, the motherboard boots up using that card. Otherwise, it defaults to the onboard graphics processor.

The choice: Auto, Disabled.

PEG Force x1

The choice: Disabled, Enable.

Chipset Thermal Throttling

This Enables or Disables Chipset Thermal Throttling

The choice: Disable, Enable.

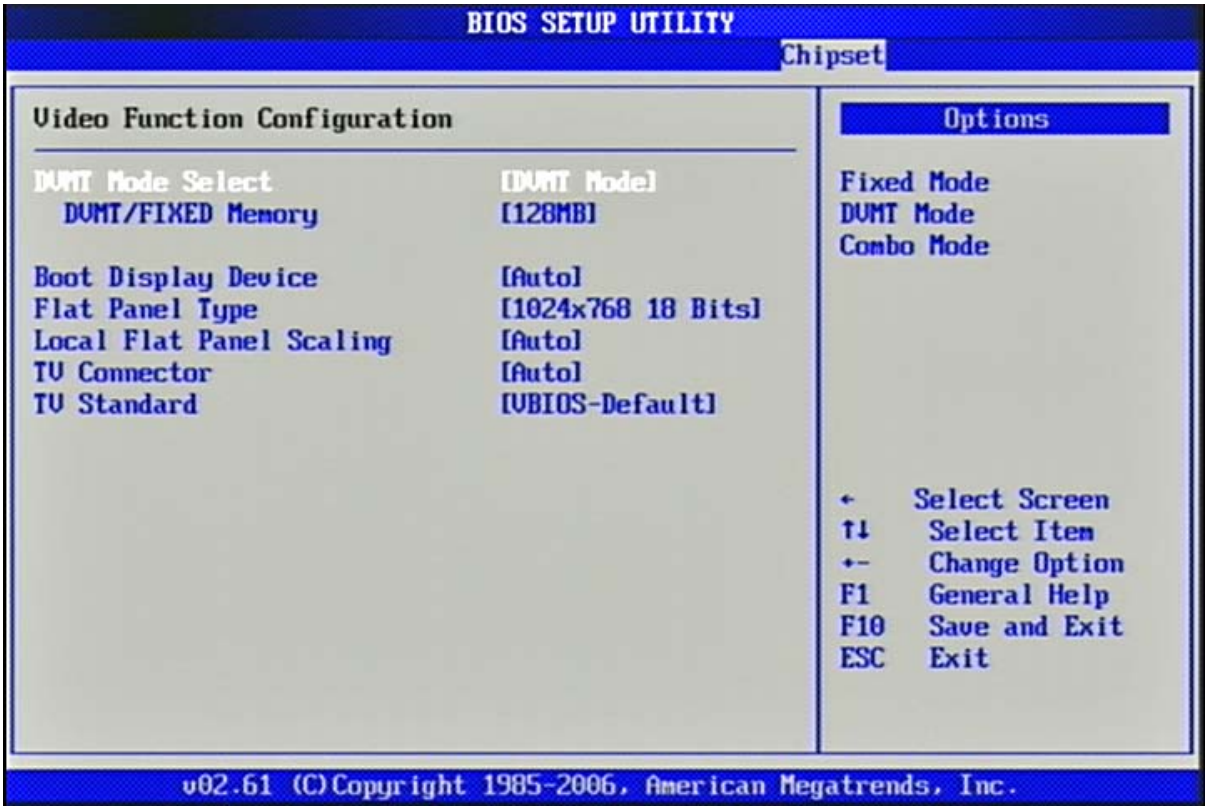
DT in SPD

The choice: Disabled, Enabled.

TS on DIMM

The choice: Disabled, Enabled.

Video Function Configuration



DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

The choice: Fixed Mode, DVMT Mode, Combo Mode.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

The choice: 64MB, 128MB, Maximum DVMT.

Boot Display Device

The choice: Auto, CRT, TV, DVI, CRT&DVI, LVDS, CRT&LVDS.

Flat Panel Type

The choice: 640x480 18 bit, 800x600 18 bit, 1024x768 18 bit, 1280x1024 18-Dual, 1400x1050 18-Dual, 1600x1200 18-Dual, 1280x768 18 bit, 1680x1050 18-Dual, 1920x1200 18-Dual, 1280x800 18 bit, 1280x600 18 bit, 2048x1536 18-Dual.

Local Flat Panel Scaling

The choice: Auto, Forced Scaling, Disabled.

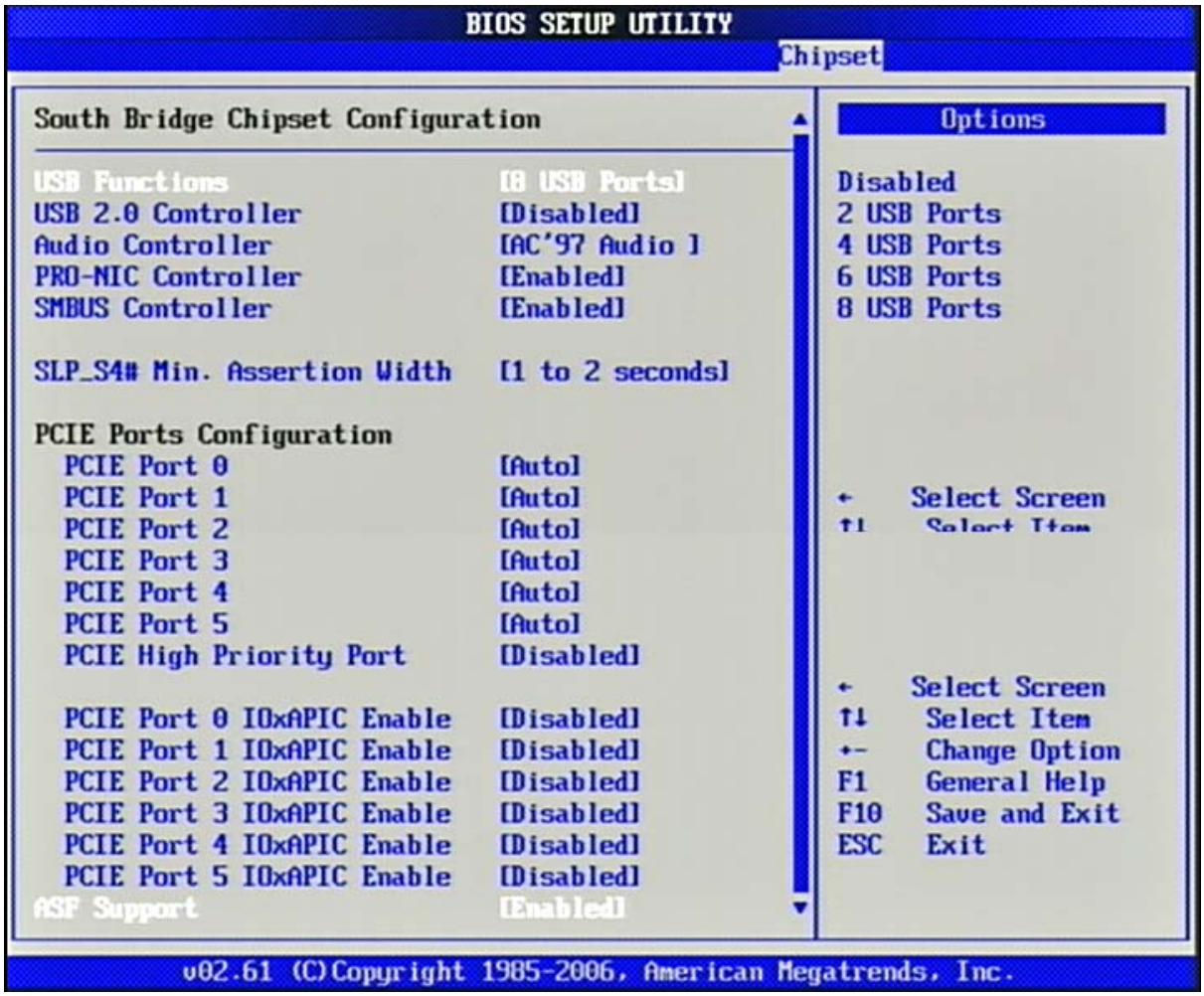
TV Connector

The choice: Auto, Composite, Component, Composite & RGB, A-Video, SCART Composite, SCART Compos & RGB, SCART Compos & S-Video, SMPTE253 Compos. RGB.

TV Standard

The choice: VBIOS-Default, NTSC, PAL, SECAM, SMPTE240M, ITU-R television, SMPTE295M, SMPTE296M, EIA-770.2, EIA-770.3.

South Bridge Configuration



USB Functions

This setting specifies the function of the onboard USB control

The choice: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports.

USB 2.0 Controller

This setting specifies the function of the onboard USB control

The choice: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports.

Audio Controller

The choice: Auto, Azalia, Disabled

PRO-NIC Controller

The choice: Enabled, Disabled.

SMBUS Controller

The choice: Enabled, Disabled.

SLP_S4# Min. Assertion Width

The choice: 4 to 5 seconds, 3 to 4 seconds, 2 to 3 seconds, 1 to 2 seconds.

PICE Port 0/1/2/3/4/5

The choice: Auto, Enabled, Disabled.

PICE High Priority Port

The choice: Disable, Port 0, Port 1, Port 2, Port 3, Port 4, Port 5.

PICE Port 0/1/2/3/4/5 IOxAPIC Enable

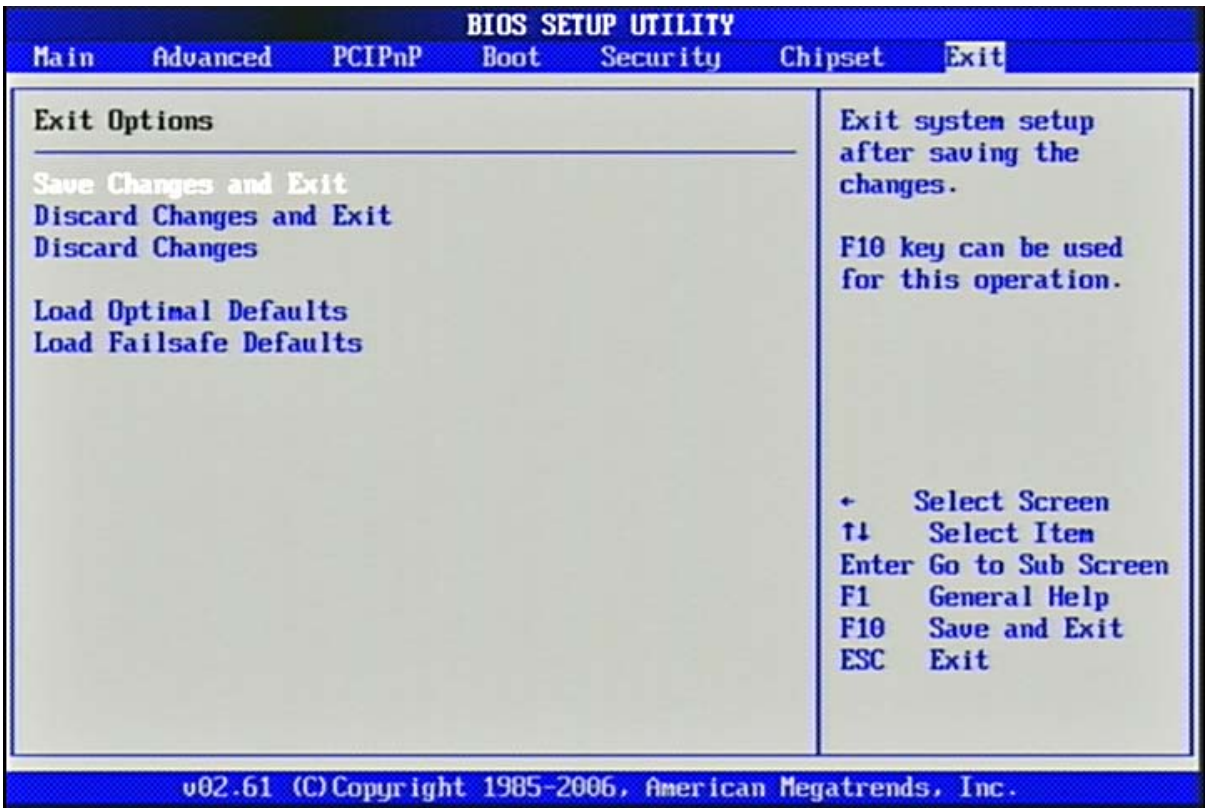
The choice: Enabled, Disabled.

ASF Support

The choice: Enabled, Disabled.

4.8 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Exit Saving Changes

Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

Discard Changes

Abandon all changes and continue with the Setup Utility.

Load Optimal Defaults

Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.

Load Failsafe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

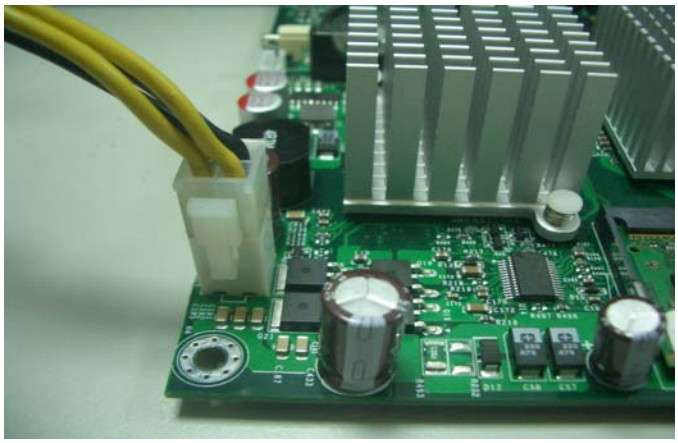
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8170 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

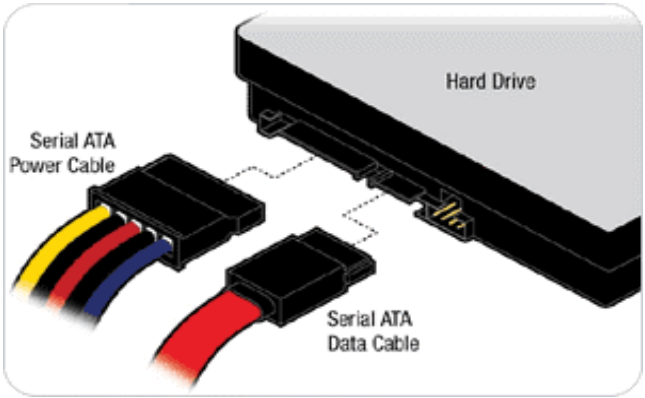
DC 12V Power Input

WADE-8170 supports DC12V input only.



Serial ATA and IDE Hard Disk Setting

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total two connectors, J14 and J15. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on DC 12V power. 200-pin DDR2 SDRAM, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8170, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 Ordering Setting

PER-4110R

One slot PCI-E x1 to PCI-Ex1

5.4 FAQ

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Information & Support

Question:I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP2 to clean your password.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they wull be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9EFF	574K	[Available]
= Conventional memory ends at 636K =		
9F00-9FBF	3K	Extended BIOS Area
9FC0-9FFF	1K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CEBF	59K	Video ROM
CEC0-EFFF	133K	Unused
F000-FFFF	64K	System ROM
HMA	64K	First 64K Extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ